

No.	Ref.	Dept.	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Electric and Electronic Engineering						Acad.	Socia
						Authors	Title	Journal	Vol., No.	Pages	Published month, year		
1	EE	5601	Power engineering/ Power conversion/ Electric machinery	<p>"Development of instantaneous heating apparatus using the high-frequency induction heating method"</p> <p>The induction heating can heat instantly and partially, and wide application is expected. In this research, heating apparatus of the beverage can that a feature of the induction heating was utilized is already developed. This apparatus has ability to heat the coffee drink which was in the canned steel of 170mL to 55 degrees Celsius in approximately 20 seconds. Power conversion efficiency was 97%, and the superior power-saving performance such as electric power unnecessary for heat insulation was realized. Application to an instantaneous water heater and medical equipment is investigated, and further possibility is expected in future.</p>	(1) <u>Kenji Amei</u> Tomohiro Yamamoto <u>Takahisa Ohji</u> <u>Masaaki Sakui</u>	Restraint Method of the Heating Irregularity and Improvement of the Efficiency in the Heating Equipment of the Beverage Can Using the High frequency Induction Heating	IEEJ Transactions on Industry Applications	Vol.133 No.1	43-49	2013	https://www.jstage.ist.go.jp/article/ieejias/133/1/133_43/article/-char/ja/	S	
					(2) Tomohiro Yamamoto <u>Kenji Amei</u> <u>Takahisa Ohji</u> <u>Masaaki Sakui</u>	A Study on the Reduction Method of the Heating Irregularity between the Can Top and Bottom and Improvement of the Efficiency in the Heating Equipment of the Beverage Can	The 23rd Symposium on Electromagnetics and Dynamics	1B3-5	177-180	2011			
					(3) Hiroaki Hashi <u>Kenji Amei</u> <u>Takahisa Ohji</u> <u>Masaaki Sakui</u>	The Trial Manufacture of Instantaneous Water Heater by the High Frequency Induction Heating	2013 IEE-Japan Industry Applications Society Conference	YPC	Y-50(CD)	2013			
2	EE	5601	Power engineering/ Power conversion/ Electric machinery	<p>"The high efficiency of the single phase multi-level inverter using the bidirectional switch"</p> <p>A PWM control by the high-frequency switching is used for the inverter circuit spreading widely mainly, but a drop of the efficiency by the switching loss is unavoidable recently. In this research, new circuit to generate a desired waveform is proposed by generating a stepped quasi-waveform using bidirectional switch without carrying out high-frequency switching. 98% of high efficiency was realized by this circuit. Furthermore, the application to a power conditioner is expected by improvement of the waveform controllability.</p>	(1) <u>Kenji Amei</u> Masahiro Kato <u>Takahisa Ohji</u> <u>Masaaki Sakui</u>	The Characteristics of a High-Efficiency Five-Level Single-Phase Inverter using Bidirectional Switches	IEEJ Transactions on Industry Applications	Vol.135 No.3	320-321	2015	https://www.jstage.ist.go.jp/article/ieejias/135/3/135_320/article/-char/ja/	S	
					(2) <u>Kenji Amei</u> <u>Takahisa Ohji</u> <u>Masaaki Sakui</u>	Characteristics of High Efficiency and Low Distortion Single Phase 7 Level Inverter without Using LC Filter	The 2010 International Power Electronics Conference (IPEC2010)		1222-1227	2010			
					(3) Seiji Adachi <u>Kenji Amei</u> <u>Takahisa Ohji</u> <u>Masaaki Sakui</u>	Trial manufacture of half bridge type single phase 3 level inverter	2013 IEE-Japan Industry Applications Society Conference	YPC	Y-39(CD)	2013			
3	EE	5601	Power engineering/ Power conversion/ Electric machinery	<p>"Maximum power point tracking control of photovoltaic power generation system / the wind generator system, and the high efficiency and longer life of the power conditioner"</p> <p>In a photovoltaic power generation and the wind power generation, a power conditioner to convert voltage generated electricity into desired voltage is necessary. In the case of a photovoltaic power generation, the power conditioner can be used only for ten years whereas the life time of the solar cell is approximately 20 years, and replacement by purchase is necessary. In this research, boost chopper circuit was divided into four, and interleave control was used. A ripple of the DC link voltage was reduced, and electrolytic capacitor-less was realized. The power conditioner which was usable without replacement by purchase for 20 years was hereby realized.</p>	(1) <u>Kenji Amei</u> Kouhei Nishida <u>Takahisa Ohji</u> <u>Masaaki Sakui</u>	Maximum Power Point Tracking Control Based on the Characteristics of the Wind Turbine for the Variable Speed Wind Power Generation System	The International Conference on Electrical Engineering 2012 (ICEE2012)		1428-1431	2012		S	
					(2) <u>Kenji Amei</u> Tatsunobu Imizu <u>Takahisa Ohji</u> <u>Masaaki Sakui</u>	Improvement of Efficiency and a Life Time of the Power Conditioner by using Interleave Control	2013 IEE-Japan Industry Applications Society Conference	R1-4, 1-27	I-151-I-152	2013			
					(3) Tomohiro Takayama <u>Kenji Amei</u> <u>Takahisa Ohji</u> <u>Masaaki Sakui</u>	Interconnection to the three-phase system with the power conditioner using the interleave control	2014 Joint Conference of Hokuriku Chapters of Electrical Societies		A-47 (CD)	2014			
4	EE	5601	Power engineering/ Power conversion/ Electric machinery	<p>"Research and human resource cultivation on next generation electric energy industry"</p> <p>Our laboratories with the high voltage technology and energy conversion technology conduct systematic education and creative research on effective utilization, for example, generation, transmission and conversion, of renewable energy in cooperation with laboratory donated by local electric power company. We are going to develop the new renewable energy technology including the improvement of energy conversion efficiency for the introduction and popularization of renewable energy. In addition, we are focusing efforts on raising talented researchers and engineers, who have fundamental knowledge and skills related to next generation electric energy industry.</p>	(1) <u>Masaaki Sakui</u> Tomoki Sakai <u>Kenji Amei</u> <u>Takahisa Ohji</u>	Development of Wind Power Generator System using Hybrid Rectifier Circuit	IEEJ Transactions on Industry Applications	Vol.133, No.3	386-387	2013	https://www.jstage.ist.go.jp/article/ieejias/133/3/133_386/article/-char/ja/	S	
					(2) Kazuyuki Tanaka <u>Kenji Amei</u> Kenichi Kawabe	Critical Generation Evaluation using Hybrid Energy Function Method	IEEJ Transactions on Power and Energy	Vol.134, No.12	941-948	2014	https://www.jstage.ist.go.jp/article/ieejipes/134/12/134_941/article/-char/ja/		
					(3) Hiroaki Ito Kazuki Kitajima	Characteristics of Pulsed Heavy Ion Beam Generated in Bipolar Pulse Accelerator	IEEJ Transactions on Fundamentals and Materials	Vol.135, No.3	136-141	2015	https://www.jstage.ist.go.jp/article/ieeifms/135/3/135_136/article/-char/ja/		

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5	EE	4404	Optical engineering/ Photon science	<p>"Theoretical investigation on the photonic properties of plasmonic nano particles"</p> <p>This is relevant to the local plasmonic resonance of nano-scale metallic particles; it indicates theoretical corrections in the conventional Mie's scattering theory. Mie's scattering theory has long been used to describe the scattering of light by spheres over a hundred years. However, to apply it to the metal nano-spheres, which attract extensive attention in recent research, one has to consider the complex permittivity with negative real part. This is remarkable in that it has shown the corrected theory for the first time in the world.</p>	(1)	Masafumi Fujii	Fundamental correction of Mie's scattering theory for the analysis of plasmonic resonance of a metal nanosphere	Physical Review A	Vol.89, Iss.3	33805	Mar. 2014	http://journals.aps.org/pr/abstract/10.1103/PhysRevA.89.033805	S	S
					(2)	Masafumi Fujii	Correction and Verification of Dispersion and Loss of Plasmons on Metal Nano-Spheres	Journal of Lightwave Technology	Vol.30, Iss.9	1284-1290	May. 2012	http://ieeexplore.ieee.org/document/6132391/		
6	EE	5606	Control engineering/ System engineering	<p>"Development of monitoring system for wandering of elderly people with dementia"</p> <p>The wandering of elderly people with dementia is a heavy burden on caregivers. Some warning systems have been developed, the transmitter for instance, but elderly people with dementia don't carry any equipment. In daily life, the sign stands for being dementia should not be realized by others. We aimed to develop a system that informs the caregiver that the patient wearing clothes painted a simple shape with fluorescent dye passes over the video camera with the black light around an entryway.</p>	(1)	Yutaka Nishigaki Kentaro Tanaka Juhvon Kim Kazuki Nakajima	Development of an image processing support system based on fluorescent dye to prevent elderly people with dementia from wandering	Proc. of 35th Annual International Conference of the IEEE EMBS		7302-7305	2013		S	S
					(2)	Kazuki Nakajima Yutaka Nishigaki Juhvon Kim	Development of an Image-Sequence Processing System to Support Preventing Going Out as Wandering of Elderly People with Dementia	Journal of Life Support Engineering	Vol.27, No.2	61-67	2015	https://www.istage.ist.go.jp/article/lifesupport/27/2/27_61/article		
7	EE	5603	Electron device/ Electronic equipment	<p>"THz sampling and THz waveform generation based on MEMS/Resonant tunneling diodes heterogeneous integration technology"</p> <p>This study aims to develop THz technologies using electron devices, based on resonant tunneling diodes, MEMS, and heterogeneous integration technology. One of the most important target is an all-electronic THz spectroscopy, which will be integrated on a chip. Moreover, THz signal generators, and THz Direct Digital Synthesizers are also investigated.</p>	(1)	Jie Pan Yuichiro Kakutani Taishu Nakayama Masayuki Mori Koichi Maezawa	Resonant Tunneling Super Regenerative Detectors Detecting Higher Frequency Signals than Their Free-Running Oscillation Frequency	IEICE Transactions on Electronics	Vvol.E98.C, No.3	260-266	2015	https://www.istage.ist.go.jp/article/transle/E98.C/3/E98.C.260/article	S	
					(2)	Koichi Maezawa Jie Pan Dongpo Wu Yuichiro Kakutani Jun Nakano Masayuki Mori	Possibility of THz detection with resonant tunneling super regenerative detectors based on extremely high order harmonics	IEICE Electronics Express	Vol.10, No.20	20130676	2013	https://www.istage.ist.go.jp/article/elex/10/20/10_10.20130676/article		
8	EE	5604	Communication/ Network engineering	<p>"Wearable Antenna and OTA Assessment Considering Human Motion and Propagation Effects for MICT Network Establishment with Cooperation of Human and Social Infrastructure"</p> <p>On the basis of the achievement from Phase I (FY2013), in Phase II, we aimed at the development of the multi-element and higher frequency technologies. Using the developed arm-swinging electromagnetic phantom and three-dimensional fading emulator, the multiple-input multiple-output (MIMO) over-the-air assessment when a human walks in a multiple radio wave propagation environment has been successfully performed. With the cooperation of Panasonic Co., Ltd, it is confirmed that the proposed antenna has the ability to realize the gigabit MIMO transmission and high reliable medical data body area network communication.</p>	(1)	Kazuhiro Honda Kun Li Koichi Ogawa	Weighted-Polarization Wearable MIMO Antenna with Three Orthogonally Arranged Dipoles Based on RF Signal Processing	IEICE Transactions on Communications	Vol.E99.B, No.1	58-68	Jan. 2016	https://www.istage.ist.go.jp/article/transcom/E99.B/1/E99.B.2015ISP0015/article	S	SS
					(2)	Kun Li Kazuhiro Honda Koichi Ogawa	Three-Dimensional Over-The-Air Assessment for Vertically Arranged MIMO Array Antennas	IEICE Transactions on Communications	Vol.E99.B, No.1	167-176	Jan. 2016	https://www.istage.ist.go.jp/article/transcom/E99.B/1/E99.B.2015EBP3148/article		
9	EE	5502	Production engineering/ Processing studies	<p>"Study on ac Ampere type magnetic levitation system"</p> <p>This study focuses on operational verification of new magnetic levitation(maglev) systems using ac Ampere forces for nonmagnetic metal products and their industrial applications. Our proposed maglev system can create a stable levitation state for a nonmagnetic object while suppressing the heat generation of the object. The effectiveness of ac Ampere type maglev is currently verified for various nonmagnetic metal products such as a circular plate, a rectangular plate, a pipe shape, or a ring shape.</p>	(1)	Noriyuki Takami Takahisa Ohji Kenji Amei Masaaki Sakui	Levitation and Rotation Tests on Aluminum Disk Using and Alternating Ampere Force Magnetic Levitation and Rotation System	Journal of the Magnetics Society of Japan	Vol.35, No.3	303-307	2011	https://www.istage.ist.go.jp/article/msimag/35/3/35_10R049zG/article/-char/ia/	S	
					(2)	Takahisa Ohji Zhen Miao Noriyuki Takami Kenji Amei Masaaki Sakui	Magnetic pole arrangement in a linear induction type magnetic levitation conveyer system by ac ampere force and levitation characteristics of an aluminum thin plate	Journal of the Japan Society of Applied Electromagnetics	Vol.19, No.3	550-556	2011			
					(3)	Takahisa Ohji K. Matsushima Zhen Miao Kenji Amei Masaaki Sakui	Conveyance Tests of a Rectangular Aluminum Plate by AC Ampere Type Linear Magnetic Levitation Conveyance System	Proc. Int. Conf. Electrical Engineering (ICEE2012)		1206-1209	2012			

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10	EE	5603	Electron device/ Electronic equipment	<p>"Self-alignment & multiple-integration technology toward flexible electronics"</p> <p>We have been studying original and new-finding technology regarding organic light-emitting diode, thin-film integrated circuit, and light-emission, sensing, and power-generation of organic & inorganic thin film materials and devices with flexible nature as follows: "Double-Faced Organic Light-Emitting Device Using Laminate Method", Complementary Circuit with Self-alignment Organic/Oxide Thin Film Transistors", and "Approaches to Realizing Sheet-Type Scanner with Scanning Light Source".</p>	(1)	Takahiro Minami Ryuichi Satoh <u>Hirovuki Okada</u> <u>Shigeki Naka</u>	Double-Faced Organic Light-Emitting Device Using Laminate Method	Japanese Journal of Applied Physics	Vol.50, No.1S2	01BC12	2011	http://iopscience.iop.org/article/10.1143/JJAP.50.01BC12/meta;isessionid=5707F6BAC2548526D6C88B399F51B8F5c3.iopscience.cld.iop.org	S	S
					(2)	Fumio Takeda Ryuichi Sato <u>Shigeki Naka</u> <u>Hirovuki Okada</u>	Complementary Circuit with Self-alignment Organic/Oxide Thin Film Transistors	Japanese Journal of Applied Physics	Vol.51, No.2R	021604	2012	http://iopscience.iop.org/article/10.1143/JJAP.51.021604/meta		
					(3)	Makoto Murase Motoshi Itagaki Takeshi Miyabayashi Hideki Hayashi <u>Shigeki Naka</u> <u>Hirovuki Okada</u>	Approaches to Realizing Sheet-Type Scanner with Scanning Light Source	Japanese Journal of Applied Physics	Vol.52, No.5S1	05DC21	May. 2013	http://iopscience.iop.org/article/10.7567/JJAP.52.05DC21/meta		
11	EE	6004	Biofunction/ Bioprocess	<p>"Studies on bio-sensing technologies and cell manipulation techniques for single cell analysis"</p> <p>Chemical sensors and biosensors were prepared at the bottom of micro wells for single cell, and cell activity was monitored by using the microwell-arrayed sensors. Techniques for seeding a single cell into a well and picking up a single cell from a well were also developed.</p>	(1)	M.Horii <u>Hiroaki Shinohara</u> <u>Yasunori Iribe</u> <u>Masayasu Suzuki</u>	Living cell-based allergen sensing using a high resolution two-dimensional surface plasmon resonance imager	Analyst	Vol.136	2706-2711	2011	http://pubs.rsc.org/en/Content/ArticleLanding/2011/AN/c0an00874e#divAbstract	S	SS
					(2)	<u>Masayasu Suzuki</u> Akira Murata <u>Yasunori Iribe</u>	Detection and collection system of target single cell based on respiration activity	Journal of Micro-Nano Mechatronics	Vol.7	79-86	2012	http://link.springer.com/article/10.1007%2Fs12213-012-0046-0		
					(3)	<u>Masayasu Suzuki</u> Ryota Nakano <u>Yasunori Iribe</u>	High Efficient Cell Leading into Microwell Array by Using Positive Dielectrophoresis	Electrochemistry	Vol.84, No.5	319-323	2016	https://www.istage.ist.go.jp/article/electrochemistry/84/5/84_15-E00181/article		
12	EE	5301	Functional solid state chemistry	<p>"Gas sensors made of oxide-semiconductor nanowires and Films"</p> <p>We are conducting study of sensors for detecting toxic or explosive gases. Gas sensitivity is enhanced by making nanowires or films thinner. We are now revising the theory of sensitivity that has recently been developed for particle sensors by Yamazoe et al. so that the theory can be applied to nanowires and films. This enables us to analyze the sensitivity depending on the thickness of the nanowires and films.</p>	(1)	N. M. Shaalan <u>Toshinari Yamazaki</u> <u>Toshio Kikuta</u>	NO2 response enhancement and anomalous behavior of n-type SnO2 nanowires functionalized by Pd nanodots	Sensors and Actuators B: Chemical	Vol.166-167	671-677	May. 2012	http://www.sciencedirect.com/science/article/pii/S0925400512003012	S	
					(2)	Dan Meng N. M. Shaalan <u>Toshinari Yamazaki</u> <u>Toshio Kikuta</u>	Preparation of tungsten oxide nanowires and their application to NO2 sensing	Sensors and Actuators B: Chemical	Vol.169	113-120	Jul. 2012	http://www.sciencedirect.com/science/article/pii/S0925400512003474		
					(3)	Dan Meng <u>Toshinari Yamazaki</u> <u>Toshio Kikuta</u>	Preparation and gas sensing properties of undoped and Pd-doped TiO2 nanowires	Sensors and Actuators B: Chemical	Vol.190	838-843	Jan. 2014	http://www.sciencedirect.com/science/article/pii/S0925400513010551		

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					Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL		
13	II	1202	Perceptual information processing	<p>"Development of ultra-accuracy 3D signal analysis technology"</p> <p>In this research, we proposed new signal analysis technology and applied motion estimation for 3D movie signal. In particular, without resorting to time domain, it is breakthrough to accurately predict the time movement by only frequency domain. We were able to show a possibility to develop into a new coding technique.</p>	(1) Takaaki Ueda Kenta Fujii <u>Shigeki Hirobayashi</u> Toshio Yoshizawa <u>Tadanobu Misawa</u>	Motion Analysis Using 3D High-Resolution Frequency Analysis	IEEE Transactions on Image Processing	Vol.22, Iss.8	2946-2959	2013	http://ieeexplore.ieee.org/document/6357278/	S	
14	II	1202	Perceptual information processing	<p>"Development of ultra-accuracy 2D signal analysis technology"</p> <p>In the 2D image signal, we proposed a frequency analysis method with ultra-high accuracy. This method applied image restoration for damaged region. In particular, it is breakthrough that proposed method can analyzed not only square shape signal but also indefinite shape signal. We showed possibility that proposed method can apply to signal analysis for various field.</p>	(1) Masaya Hasegawa Takahiro Kako <u>Shigeki Hirobayashi</u> <u>Tadanobu Misawa</u> Toshio Yoshizawa <u>Yasuhiro Inazumi</u>	Image Inpainting on the Basis of Spectral Structure from 2-D Nonharmonic Analysis	IEEE Transactions on Image Processing	Vol.22, Iss.8	3008-3017	2013	http://ieeexplore.ieee.org/document/6490052/	S	
15	II	1302B	Service informatics	<p>"Research and development on dynamic map creation by road surface condition analysis"</p> <p>In our research, we will develop technologies for automobile driving society. We integrate the image information obtained from the camera and the sensing information from various sensors to discriminate the road surface condition with high accuracy. We also create a dynamic map / hazard map by integrating these sensor information and create information distribution technology.</p>	(1) <u>Yuukou Horita</u> Kunimitsu Fujita <u>Keiji Shibata</u>	Tram route navigation system for smartphone	19th ITS World Congress (October 22-26, 2012, Vienna),		8 pages	2012		S	
					(2) <u>Keiji Shibata</u> Kunimitsu Fujita <u>Yuukou Horita</u>	Assessment of Tram Location and Route Navigation System in Toyama Light Rail Transit	12th International Conference on ITS Telecommunications (ITST2012), (November 5-8, 2012, Taipei),		722-726	2012			
16	II	1003	Statistical science	<p>"Basic Research for Sensing and Communications"</p> <p>In this research, we consider a classical data aggregation problem with many independent sensors under the resource constraint. Focusing on a brand new model for efficient coding, our information theoretic analysis helps us find a non-trivial tradeoff which might offer some optimal strategies for the issue.</p>	(1) <u>Tatsuto Murayama</u> Koji Okino <u>Masato Tajima</u> Peter Davis	Aggregation Principle for Independent Noisy Observations: A Scaling-law Perspective	2nd Korea-Japan Joint Workshop on Complex Communication Sciences (KJCCS'13), Okinawa			2013		S	
17	II	5604	Communication/ Network engineering	<p>"The proposal and demonstration experiment of QAM (Quadrature Amplitude Modulation) conversion of multi-channel CATV signals by using external optical modulators for emergency signal broadcast of earthquake and tsunami"</p> <p>This research is proposing the new QAM modulation method. By using the proposed method, multi-channel CATV signals can be modulated simultaneously by the one single emergency signal of earthquake and tsunami. The method can be executed rapidly and definitely with showing the imminent moving pictures on TV set. (Conventional method shows the superimposed letters only.) This research aims at the first proposal and demonstration experiment of this new QAM modulation method in the world.</p>	(1) <u>Koji Kikushima</u>	Proposal of QAM Conversion of Multi-Chnnel CATV Signals by Using External Optical Modulators	The Journal of The Institute of Image Information and Television Engineers	Vol.68, No.11	J517-J521	2014	https://www.istage.ist.go.jp/article/itej/68/11/68_J517/article-char/ia/	S	

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18	II	2201B	Safety System	<p>"Research and Development of Information Delivery by Sensing and Hazard Maps for Various Disaster"</p> <p>We developed a new road surface sensor that allows determining the road surface condition by integrating the sensing information from the various sensors and a video camera. Our research is the creation of the foundation technology of hazard map generation and information delivery that correspond to various ground resolution by using the integration of the sensor information.</p>	(1) <u>Keiji Shibata</u> Kazuya Takeuchi Shohei Kawai <u>Yuukou Horita</u>	Detection of Road Surface Conditions in Winter using Road Surveillance Cameras at Daytime, Night-time and Twilight	International Journal of Computer Science and Network Security	Vol.14, No.11	21-24	Nov. 2014		SS	
19	II	6201	Neurophysiology/ General neuroscience	<p>"Studies on central synaptic plasticity"</p> <p>Metabotropic glutamate receptor mGluR1 in cerebellar Purkinje cell is a trigger to induce a form of synaptic plasticity crucial for motor learning. We found that the C-terminus of mGluR1 regulates the subcellular distribution and function of the receptor through a comparison of mGluR1 variants. We also found that mGluR1 forms complexes with adenosine receptor A1R and is modulated by A1R. This modulation may regulate the induction of the synaptic plasticity.</p>	(1) Yoshiaki Ohtani Mariko Miyata Kouichi Hashimoto <u>Toshihide Tabata</u> Yasushi Kishimoto Masahiro Fukaya Daisuke Kase Hidetoshi Kassai Kazuki Nakao Tatsumi Hirata Masahiko Watanabe Masanobu Kano Atsu Aiba	The Synaptic Targeting of mGluR1 by Its Carboxyl-Terminal Domain Is Crucial for Cerebellar Function	The Journal of Neuroscience	Vol.34, No.7	2702-2712	2014	http://www.jneurosci.org/content/34/7/2702	S	
					(2) Yuji Kamikubo Takeshi Shimomura Yosuke Fujita <u>Toshihide Tabata</u> Taku Kashiwara Takashi Sakurai Kenkichi Fukurotani Masanobu Kano	Functional cooperation of metabotropic adenosine and glutamate receptors regulates postsynaptic plasticity in the cerebellum	The Journal of Neuroscience	Vol.33, No.47	18661-18671	2013	http://www.jneurosci.org/content/33/47/18661		
20	II	6201	Neurophysiology/ General neuroscience	<p>"Study on the development of brain circuitry"</p> <p>We demonstrate that neuronal activities promote the formation of neural circuitry in the developing cerebral cortex, influencing on axonal branching.</p>	(1) Akito Yamada Naofumi Uesaka Yasufumi Hayano <u>Toshihide Tabata</u> Masanobu Kano Nobuhiko Yamamoto	Role of pre- and postsynaptic activity in thalamocortical axon branching	Proceedings of the National Academy of Sciences of the United States of America (PNAS)	Vol.107, No.16	7562-7567	2010	http://www.pnas.org/content/107/16/7562	SS	

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21	MIS	5501	Materials/ Mechanics of materials	<p>"Fatigue evaluation of structural materials using three-dimensional magnetic microscopy"</p> <p>Fatigue failure in steel occurs when cracks form in a component and continue to grow to a size large enough to cause fracture. Non-destructive evaluation methods that can be correlated to in-situ measurements around the crack tips are necessary in order to understand the crack initiation and propagation phenomena. A scanning Hall probe microscope (SHPM) equipped in a GaAs film sensor was constructed for this study and fatigue cracks in steel were observed as they grew.</p>	(1) <u>Katsuyuki Kida</u> Edson Costa Santos Megumi Uryu Takashi Honda Justyna Anna Rozwadowska Kenichi Saruwatari	Changes in magnetic field intensities around fatigue crack tips of medium carbon low alloy steel (S45C, JIS)	International Journal of Fatigue	Vol.56	33-41	Nov. 2013	http://www.sciencedirect.com/science/article/pii/S0142112313002077	S	S
					(2) Takashi Honda Edson Costa Santos <u>Katsuyuki Kida</u>	Scanning Hall probe microscopy of residual magnetic fields around plastic deformation of Vickers indentations in carbon tool steel (JIS, SKS93)	Mechanics of Materials	Vol.69, Iss.1	262-269	Feb. 2014	http://www.sciencedirect.com/science/article/pii/S0167663613001543		
					(3) <u>Katsuyuki Kida</u>	IAAM Medal	Advanced Materials World Congress (AMWC 2013, Çeşme, Turkey)			2013			
22	MIS	5501	Materials/ Mechanics of materials	<p>"Heat treatment of stainless steels and its application to machine components"</p> <p>13%Cr martensitic stainless steels are widely used in the production of many mechanical components that require high hardness and good corrosion resistance. In the present work, 20mm-diameter 13Cr-2Ni-2Mo steel bars were quenched by induction heating (IH) method and after that tempered in a furnace. 240 hours corrosion test of the bars was carried out using a salt spray testing method (JIS Z 2371:2000). The results were compared to two stainless steels, SUS304 and SUS440C. Their inner hardness distributions were measured. It was found that the hardness of IH-quenched and furnace-tempered 13Cr-2Ni-2Mo stainless steel is almost the same as that of the SUS440C. The 13Cr-2Ni-2Mo steel has the same corrosion resistance as the SUS304 steel. Furthermore, a new Homology method was applied to the structure observation.</p>	(1) <u>Katsuyuki Kida</u> Koretomo Okamoto Masayuki Ishida <u>Koshiro Mizobe</u> Takuya Shibukawa	Observation of Corrosion Resistance of 13Cr-2Ni-2Mo Stainless Steel Quenched by Induction Heating	Applied Mechanics and Materials	Vol.597	140-143	2014	https://www.scientific.net/AMM.597.140	S	
					(2) <u>Katsuyuki Kida</u> Shintaro Hazeyama Takuma Sado <u>Koshiro Mizobe</u> Takuya Shibukawa	Crack Initiation Observation in Early Stage of Rolling Contact Fatigue of SUJ2 using a Single-Ball Apparatus	Applied Mechanics and Materials	Vol.620	421-424	2014	https://www.scientific.net/AMM.620.421		
					(3) <u>Koshiro Mizobe</u> Kazumoto Okamoto Kenji Kanemasu Takuya Shibukawa <u>Katsuyuki Kida</u>	Observation of rolling contact fatigue of induction-heated 13Cr-2Ni-2Mo stainless steel under reciprocating motion	Materials Research Innovations	Vol.18, Iss.sup5	S52-S56	2014	http://www.tandfonline.com/doi/abs/10.1179/1432891714Z.00000000907?journalCode=vmri20		
23	MIS	5501	Materials/ Mechanics of materials	<p>"Plastic bearing and health monitoring"</p> <p>Tribological performance of polyetheretherketone (PEEK), polytetrafluoroethylene (PTFE) and polyphenylene sulphide (PPS) has been researched extensively in the recent years and according to the results PEEK is a promising polymer for the production of precision-machined custom bearings expected to suit special market needs.</p> <p>Due to its self-lubrication ability, high impact durability, high corrosion resistance, low specific gravity, high melting and glass transition temperatures, small plastic bearings are used in machine components. We studied the rolling contact fatigue behaviour of radial PEEK bearing under dry conditions. Under low (<80N) and high (>100N) radial loads bearings failed by adhesion and seizure, respectively. Under medium loads however, the components achieved relatively long lives, as well as a unique feature of self-lubrication. We established an optimum load range to assure the longest possible service life of PEEK bearing elements.</p>	(1) Ranjith-K Sreenilayam-R Michael H. Azarian C. Morillo Michael G. Pecht <u>Katsuyuki Kida</u> E.C. Santos Takashi Honda Hitonobu Koike	Comparative evaluation of metal and polymer ball bearings	Wear	Vol.302, Iss.1-2	1499-1505	2013	http://www.sciencedirect.com/science/article/pii/S0043164813000793	S	
					(2) Hitonobu Koike <u>Katsuyuki Kida</u> Edson Costa Santos Justyna Rozwadowska Yuji Kashima Kenji Kanemasu	Self-lubrication of PEEK polymer bearings in rolling contact fatigue under radial loads	Tribology International	Vol.49	30-38	May. 2012	http://www.sciencedirect.com/science/article/pii/S0301679X11003586		
					(3) Hitonobu Koike <u>Katsuyuki Kida</u> <u>Koshiro Mizobe</u> Xiaochen Shi Shunsuke Oyama Yuji Kashima	Wear of hybrid radial bearings (PEEK ring- PTFE retainer and alumina balls) under dry rolling contact	Tribology International	Vol.90	77-83	Oct. 2015	http://www.sciencedirect.com/science/article/pii/S0301679X15001486		
24	MIS	5501	Materials/ Mechanics of materials	<p>"Shear strength of silicon nitride ceramic material which is used in high-pressure fuel supply pumps"</p> <p>Recently, new diesel engines have been developed in order to decrease pollutants. When the fuel pressure in these systems is increased, there is a decrease in the production of pollutants such as NOx, CO2, CO, HC and PM particles. In particular, these systems are much more effective in reducing the amount of PM particles than exhaust gas recirculation systems. These new engines have a common-rail system with a high-pressure fuel supply pump. In this paper, toughness in the silicon nitride used in the pump was evaluated.</p>	(1) <u>Katsuyuki Kida</u> Takashi Honda Edson Costa Santos	Fatigue characterisation of HIP-silicon nitride under shear stress: effect of stress ratio on surface crack growth in silicon nitride square bar under cyclic torsion	Materials Research Innovations	Vol.18, Iss.sup5	S5-1-S5-4	2014	http://www.tandfonline.com/doi/abs/10.1179/1432891714Z.00000000897?journalCode=vmri20	S	
					(2) <u>Katsuyuki Kida</u> Junnosuke Koga Edson Costa Santos	Crack growth and splitting failure of silicon nitride ceramic balls under cyclic pressure loads	Mechanics of Materials	Vol.106	58-66	Mar. 2017	http://www.sciencedirect.com/science/article/pii/S0167663617300248		

No.	Dept.	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Mechanical and Intellectual Systems Engineering							Acad.	Socia
					Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL		
25	MIS	5501	Materials/ Mechanics of materials	<p>“Development of new quenching method for material structure transformation and fatigue strength improvement”</p> <p>We developed a new repeated quenching method for the high carbon high chromium steel which have very refined microstructure. We investigated its heating and quenching conditions and observed the different type of crack origins in the specimens which were different quenching times. Our research was evaluated that we confirmed the relation between microstructure refinement and the inclusions type of the crack origin.</p>	(1) Hitoshi Mahara <u>Koshiro Mizobe</u> <u>Katsuyuki Kida</u> Kazuaki Nakane	Image analyzing method to detect vague boundaries by using reaction-diffusion system	Applied Numerical Mathematics	Vol.114	124-131	Apr. 2017	http://www.sciencedirect.com/science/article/pii/S0168927416301660	S	
					(2) <u>Koshiro Mizobe</u>	Influence of retained austenite refinement on the microstructure near non-metallic inclusions and the rotating bending fatigue strength	2013 3rd International Conference on Advanced Materials and Engineering Materials, Singapore			Dec. 2013			
					(3) <u>Koshiro Mizobe</u> Takashi Honda Hitonobu Koike Edson Costa Santos <u>Katsuyuki Kida</u> Takuya Shibukawa	Relationship between repeatedly quenching and fisheye cracks around TiN and Al2O3 inclusions in high carbon bearing steel	Materials Research Innovations	Vol.18, Iss.sup1	60-65	2014	http://www.tandfonline.com/doi/abs/10.1179/1432891713Z00000000355?journalCode=vmri20		
26	MIS	6101	Aerospace engineering	<p>“Aerodynamic Design for Next Generation Supersonic Transport using Computational Fluid Dynamics”</p> <p>The research is conducted with the JAXA (Japan Aerospace Exploration Agency) to obtain efficient and environmentally-friendly SST (supersonic transport). Such next generation SST must have both of low-drag and low-boom characteristics. We have developed CFD(Computational Fluid Dynamics) system of boundary layer's stability analysis, Navier-Stokes simulation and inverse-problem solver for geometry design. Then, we are going to propose new varieties of next generation SST shapes using the developed system.</p>	(1) Yoshine Ueda Kenji Yoshida <u>Kisa Matsushima</u> Hiroaki Ishikawa	Supersonic Natural-Laminar-Flow Wing-Design at High-Reynolds-Number	AIAA Journal	Vol.52, No.6	1294-1306	2014	http://arc.aiaa.org/doi/10.2514/1.J052555	S	S
					(2) Kazuhiro Kusunose <u>Kisa Matsushima</u> Daigo Maruyama	Supersonic biplane -A review	Progress in Aerospace Sciences	Vol.47, Iss.1	53-87	Jan. 2011	http://www.sciencedirect.com/science/article/pii/S0376042110000588		

No.	Ref.	D e p t .	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Life Sciences and Bioengineering							A c a d .	S o c i a l
						Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL		
27	L B	6004	Biofunction, Bioprocess	<p>"Development of the streamlined system for the generation of high-performance antigen-specific antibodies from single cells"</p> <p>Monoclonal antibodies have been utilized for the purpose of development of therapeutics, diagnostics, and research reagents. The major challenge for these developments is the acquisition of antibodies satisfying requirements for each application. We have succeeded in producing a high-performance system capable of isolation of the best-suited antigen-specific antibodies as short as 4 days by taking advantage of newly developed methods for the identification of antigen-specific antibody producing cells, the automated cDNA synthesis from hundreds of single cells, and the construction of linear DNA molecules for expression of antibody genes.</p>	(1)	Nobuyuki Kurosawa Megumi Yoshioka Rika Fujimoto Fuminori Yamagishi Masaharu Isobe	Rapid production of antigen-specific monoclonal antibodies from a variety of animals	BMC Biology	Vol.10	80	Sep. 2012	http://bmcbiol.biomedcentral.com/articles/10.1186/1741-7007-10-80	S	SS
					(2)	Megumi Yoshioka Nobuyuki Kurosawa Masaharu Isobe	Target-selective joint polymerase chain reaction: a robust and rapid method for high-throughput production of recombinant monoclonal antibodies from single cells	BMC Biotechnology	Vol.11	75	Jul. 2011	http://bmcbiotechnol.biomedcentral.com/articles/10.1186/1472-6750-11-75		
					(3)	Nobuyuki Kurosawa Megumi Yoshioka Masaharu Isobe	Target-selective homologous recombination cloning for high-throughput generation of monoclonal antibodies from single plasma cells	BMC Biotechnology	Vol.11	39	Apr. 2011	http://bmcbiotechnol.biomedcentral.com/articles/10.1186/1472-6750-11-39		
28	L B	6501	Genome biology	<p>"Post-genome analysis of arrhythmia"</p> <p>We identified several novel mutations in the genes of arrhythmia patients and demonstrate the abnormal function of the product ion channels using patch-clamp techniques. We also reveal that interaction with Yotiao is not sufficient for maintaining the normal function of KCNQ1 channel and that a mutant KCNE1 subunit leads to the functional abnormalities of multiple ion channels. This findings provide a new insight into the pathogenic mechanism of arrhythmia.</p>	(1)	Koshi Kinoshita Takuto Komatsu Kohki Nishide Yukiko Hata Nozomi Hisajima Hiroyuki Takahashi Katsuya Kimoto Kei Aonuma Eikichi Tsushima Toshihide Tabata Tomoyuki Yoshida Hisashi Mori Kunihiro Nishida Yoshiaki Yamaguchi Fukiko Ichida Kenkichi Fukurotani Hiroshi Inoue Naoki Nishida	A590T mutation in KCNQ1 C-terminal helix D decreases IKs channel trafficking and function but not Yotiao interaction	Journal of Molecular and Cellular Cardiology	Vol.72	273-280	Jul. 2014	http://www.sciencedirect.com/science/article/pii/S0022282814000960	S	
					(2)	Yoshiaki Yamaguchi Kohki Nishide Mario Kato Yukiko Hata Koichi Mizumaki Koshi Kinoshita Yuki Nonobe Toshihide Tabata Tamotsu Sakamoto Naoya Kataoka Yosuke Nakatani Fukiko Ichida Hisashi Mori Kenkichi Fukurotani Hiroshi Inoue Naoki Nishida	Glycine/serine polymorphism at position 38 influences KCNE1 subunit's modulatory actions on rapid and slow delayed rectifier K ⁺ currents	Circulation Journal	Vol.78, No.3	610-618	2014	https://www.istage.ist.go.jp/article/circj/78/3/78-CJ-13-1126/article		
					(3)	Koshi Kinoshita Yoshiaki Yamaguchi Kohki Nishide Katsuya Kimoto Yuki Nonobe Akira Fujita Kenta Asaono Toshihide Tabata Hisashi Mori Hiroshi Inoue Yukiko Hata Kenkichi Fukurotani Naoki Nishida	A novel missense mutation causing a G487R substitution in the S2-S3 loop of human ether-à-go-go-related gene channel	Journal of Cardiovascular Electrophysiology	Vol.23, Iss.11	1246-1253	Nov. 2012	http://onlinelibrary.wiley.com/doi/10.1111/j.1540-8167.2012.02383.x/abstract		

No.	Ref.	Dept.	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Life Sciences and Bioengineering							Acad.	Soc. Sci.
						Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL		
29	L B			Pharmacology	Using global gene-expression analysis by microarray systems, we have succeeded to understand the mechanisms of the regulation of gene expression by neural stimulation. Additionally, we identified a marker for tumor with hypoxic regions, and revealed the mechanisms of which orexin prevents insulin resistance.	(1) Mamoru Fukuchi Akiko Tabuchi Yuki Kuwana Shinjiro Watanabe Minami Inoue <u>Ichiro Takasaki</u> Hironori Izumi Ayumi Tanaka Ran Inoue Hisashi Mori Hidetoshi Komatsu Hiroshi Takemori Hiroyuki Okuno Haruhiko Bito Masaaki Tsuda	Neuromodulatory effect of Gαs- or Gαq-coupled G-protein-coupled receptor on NMDA receptor selectively activates the NMDA receptor/Ca2+/calmodulin-dependent protein kinase II response element-binding protein-regulated transcriptional coactivator 1 pathway to effectively induce brain-derived neurotrophic factor expression in neurons	Journal of Neuroscience	35(14)	5606-24	2015	http://www.jneurosci.org/content/35/14/5606	SS	
						(2) Ibuki Nakamura Susumu Hama Shoko Itakura <u>Ichiro Takasaki</u> Takayuki Nishi Yoshiaki Tabuchi Kentaro Kogure	Lipocalin2 as a plasma marker for tumors with hypoxic regions	Scientific Reports	4	7235-	2014	http://www.nature.com/articles/srep07235	SS	
						(3) Hiroshi Tsuneki Emi Tokai Yuya Nakamura Keisuke Takahashi Mikio Fujita Talejorp Asaoka Kanta Kon Yuuki Anzawa Tsutomu Wada <u>Ichiro Takasaki</u> Kumi Kimura Hiroshi Inoue Masashi Yanagisawa Takeshi Sakurai Sasaoka Sasaoka	Hypothalamic orexin prevents hepatic insulin resistance via daily bidirectional regulation of autonomic nervous system in mice	Diabetes	Vol.64, No.2	459-70	2015	http://diabetes.diabetesjournals.org/content/64/2/459	SS	
30	L B			Pharmacology	Using global gene-expression analysis by microarray systems, we have succeeded to understand the mechanisms of the regulation of gene expression by neural stimulation. Additionally, we identified a marker for tumor with hypoxic regions, and revealed the mechanisms of which orexin prevents insulin resistance.	(1) Mamoru Fukuchi Akiko Tabuchi Yuki Kuwana Shinjiro Watanabe Minami Inoue <u>Ichiro Takasaki</u> Hironori Izumi Ayumi Tanaka Ran Inoue Hisashi Mori Hidetoshi Komatsu Hiroshi Takemori Hiroyuki Okuno Haruhiko Bito Masaaki Tsuda	Neuromodulatory effect of Gαs- or Gαq-coupled G-protein-coupled receptor on NMDA receptor selectively activates the NMDA receptor/Ca2+/calmodulin-dependent protein kinase II response element-binding protein-regulated transcriptional coactivator 1 pathway to effectively induce brain-derived neurotrophic factor expression in neurons	Journal of Neuroscience	35(14)	5606-24	2015	http://www.jneurosci.org/content/35/14/5606	SS	
						(2) Ibuki Nakamura Susumu Hama Shoko Itakura <u>Ichiro Takasaki</u> Takayuki Nishi Yoshiaki Tabuchi Kentaro Kogure	Lipocalin2 as a plasma marker for tumors with hypoxic regions	Scientific Reports	4	7235-	2014	http://www.nature.com/articles/srep07235	SS	
						(3) Hiroshi Tsuneki Emi Tokai Yuya Nakamura Keisuke Takahashi Mikio Fujita Talejorp Asaoka Kanta Kon Yuuki Anzawa Tsutomu Wada <u>Ichiro Takasaki</u> Kumi Kimura Hiroshi Inoue Masashi Yanagisawa Takeshi Sakurai Sasaoka Sasaoka	Hypothalamic orexin prevents hepatic insulin resistance via daily bidirectional regulation of autonomic nervous system in mice	Diabetes	Vol.64, No.2	459-70	2015	http://diabetes.diabetesjournals.org/content/64/2/459	SS	

No.	Dept.	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Life Sciences and Bioengineering							Acad.	Soc. Sci.	
					Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL			
31	L B	6004	Biofunction, Bioprocess	<p>"Real-time observation of intracellular reactions by using a surface plasmon resonance imager without probe reagents and its application for evaluation of pharmacological action"</p> <p>We have succeeded to monitor intracellular reactions in mammalian cells at real-time by using a high resolution surface plasmon resonance imager which can sense local refractive index change near the cell bottom at single cell level. This method needs no probe reagents for visualization to achieve intact intracellular observation and evaluation of drug action for cell membrane receptors. We are now going on the application study of this method for non-invasive evaluation of stem cell differentiation.</p>	(1)	Masae Horii Hiroaki Shinohara Yasunori Iribe Masayasu Suzuki	Living cell-based allergen sensing using a high resolution two-dimensional surface plasmon resonance imager	Analyst	Vol.136, Iss.13	2706-2711	Apr. 2011	http://pubs.rsc.org/en/Content/ArticleLanding/2011/AN/c0an00874e#divAbstract	S	
					(2)	Hiroaki Shinohara Yhutarou Sakai Tanveer Ahamd Mir	Real-time monitoring of intracellular signal transduction in PC12 cells by two-dimensional surface plasmon resonance imager	Analytical Biochemistry	Vol.441, Iss.2	185-189	Oct. 2013	http://www.sciencedirect.com/science/article/pii/S0003269713003357		
					(3)	Tanveer Ahamd Mir Hiroaki Shinohara	Two-dimensional surface plasmon resonance imager: An approach to study neuronal differentiation	Analytical Biochemistry	Vol.443, Iss.1	46-51	Dec. 2013	http://www.sciencedirect.com/science/article/pii/S0003269713003928		
32	L B	7806	Drug development chemistry	<p>"Synthesis and evaluations of new candidate of drugs based upon rational design"</p> <p>(1) This paper is concerning the development of new candidate of anti-cancer agent based upon the inhibitors of human aldo-keto reductase. This approach has been attracted in clinical site, and this paper has been cited 27 times, previously. (2) This paper describes on the development of new anti-cancer agent based upon the antiausterity strategy, which is one of the most promising target for treatment of pancreatic cancer. (3) This paper describes on the development of new insulin-sensitizing agent based upon inhibitory effects on SH2 domain-containing inositol 5'-phosphatase 2 (SHIP2). The insulin-sensitizing agent is now most desirable agent for treatment of diabetes mellitus.</p>	(1)	Midori Soda Dawei Hu Satoshi Endo Mayuko Takemura Jie Li Ryogo Wada Syohei Ifuku Hai Tao Zhao Ossama El-Kabbani Shozo Ohta Keiko Yamamura Naoki Toyooka Akira Hara Toshiyuki Matsunaga	Design, synthesis and evaluation of caffeic acid phenethyl ester-based inhibitors targeting a selectivity pocket in the active site of human aldo-keto reductase 1B10	European Journal of Medicinal Chemistry	Vol.48	321-329	Feb. 2012	http://www.sciencedirect.com/science/article/pii/S0223523411009159	S	
					(2)	Naoki Kudou Akira Taniguchi Kenji Sugimoto Yuji Matsuya Masashi Kawasaki Naoki Toyooka Chika Miyoshi Suresh Awale Dya Fita Dibwe Hiroyasu Esumi Shigetoshi Kadota Yasuhiro Tezuka	Synthesis and antitumor evaluation of arctigenin derivatives based on antiausterity strategy	European Journal of Medicinal Chemistry	Vol.60	76-88	Feb. 2013	http://www.sciencedirect.com/science/article/pii/S0223523411007088		
					(3)	Yoshinori Ichihara Ryohei Fujimura Hiroshi Tsuneki Tsutomu Wada Kentaro Okamoto Hiroaki Gouda Syuichi Hirono Kenji Sugimoto Yuji Matsuya Toshiyasu Sasaoka Naoki Toyooka	Rational design and synthesis of 4-substituted 2-pyridin-2-ylamides with inhibitory effects on SH2 domain-containing inositol 5'-phosphatase 2 (SHIP2)	European Journal of Medicinal Chemistry	Vol.62	649-660	Apr. 2013	http://www.sciencedirect.com/science/article/pii/S0223523413000421		

No.	Ref.	Dept.	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Life Sciences and Bioengineering							Acad.	Soc. Sci.	
						Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL			
33	L B	2301A,B		Biomedical engineering/ Biomaterial science and engineering	<p>"Researches on Bioprinting & Biofabrication"</p> <p>We proposed an innovative approach of tissue engineering, which is called "Bioprinting and Biofabrication". In this approach, 3D biological tissues are designed and fabricated based on CAD/CAM/CAE(Computer aided designing/ manufacturing/ engineering) approach. We have challenged to develop effective bio-manufacturing methods, tools, machines and proper materials for this approach. And we are engaging to develop effective perfusion system to invubate tissues and organs, too.</p>	(1)	Shintaroh Iwanaga Noriaki Saito Hidetoshi Sanae Makoto Nakamura	Facile fabrication of uniform size-controlled microparticles and potentiality for tandem drug delivery system of micro/nanoparticles	Colloids and Surfaces B: Biointerfaces	Vol.109	301-306	Sep. 2013	http://www.sciencedirect.com/science/article/pii/S0927776513002543	S	SS
						(2)	Shintaroh Iwanaga Kenichi Arai Makoto Nakamura	Chapter 4 · Inkjet Bioprinting	Essentials of 3D Biofabrication and Translation	1st Edition	Chapter 4 61-79	2015	http://www.sciencedirect.com/science/article/pii/B9780128009727000049		
						(3)	Makoto Nakamura Tanbeer Ahmad Mir Kenichi Arai Satoru Ito Toshiko Yoshida Shintaroh Iwanaga Hiromi Kitano Chizuka Obara Toshio Nikaido	Bioprinting with pre-cultured cellular constructs towards tissue engineering of hierarchical tissues	International Journal of Bioprinting	Vol.1, No.1	39-48	2015	http://ijb.whioce.com/index.php/int-j-bioprinting/article/view/01007		
						(4)	Makoto Nakamura Tanbeer Ahmad Mir Kenichi Arai Satoru Ito Toshiko Yoshida Shintaroh Iwanaga Hiromi Kitano Chizuka Obara Toshio Nikaido	Bioprinting with pre-cultured cellular constructs towards tissue engineering of hierarchical tissues	International Journal of Bioprinting	Vol.1, No.1	39-48	2015	http://ijb.whioce.com/index.php/int-j-bioprinting/article/view/01007		
						(5)	Kenich Arai Yoshinari Tsukamoto Hirotoshi Yoshida Hidetoshi Sanae Tanveer Mir Ahmad Shinji Sakai Toshiko Yoshida Motonari Okabe Toshio Nikaido Masahito Taya Makoto Nakamura	The development of cell-adhesive hydrogel for 3D printing	International. Journal of Bioprinting	Vol.2, No.2	44-53	2016	http://ijb.whioce.com/index.php/int-j-bioprinting/article/view/76		
						(6)	Jurgen Groll Thomas Boland Torsten Blunk Jason A Burdick Dong-Woo Cho Paul D Dalton Brian Derby Gabor Forgacs Qing Li Vladimir A Mironov Lorenzo Moroni Makoto Nakamura Wenmiao Shu Shoji Takeuchi Giovanni Vozzi Tim B F Woodfield Tao Xu James J Yoo Jos Malda	Biofabrication: reappraising the definition of an evolving field	Biofabrication.	Vol.8, No.1	13001	Jan. 2016	http://iopscience.iop.org/article/10.1088/1758-5090/8/1/013001/meta		

No.	Ref.	Dept.	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Environmental Applied Chemistry							Acad.	Soc. Sci.
						Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL		
34	EAC	5301	Functional solid state chemistry	<p>"Air-stable, Recyclable, and Regenerative Palladium(0) Catalysts for C-C Cross-Coupling Reactions"</p> <p>Palladium catalyzed reactions such as Suzuki-Miyaura coupling, Heck reaction, Negishi coupling (three of them are Nobel prize laureates) are very useful for organic syntheses but unfavorable for industrial use because catalytically active Pd(0) species are not stable in the air and hard to reuse. This work overcame these problems by preparing air-stable, recyclable, and regenerative phosphine sulfide palladium(0) catalysts which are advantageous in terms of the environment and costs.</p>	(1)	Senichi Aizawa Takuya Kawamoto Yuuto Asai Chie Ishimura	Stepwise Phosphine Sulfide Formation and Metal-Bridging Reaction of Tetradentate and Tridentate Phosphine Ligands on Palladium(II)	Journal of Organometallic Chemistry	Vol.695, Iss.8	1253-1260	Apr. 2010	http://www.sciencedirect.com/science/article/pii/S0022328X10000872	S	S
					(2)	Senichi Aizawa Tatsuya Kawamoto Suji Nishigaki Ayano Sasaki	Preparation and properties of sandwiched trinuclear palladium (II) complexes with tridentate phosphine and phosphine sulfide ligands	Journal of Organometallic Chemistry	Vol.696, Iss.11-12	2471-2476	Jun. 2011	http://www.sciencedirect.com/science/article/pii/S0022328X11002026		
35	EAC	5304	Analytical chemistry	<p>"Enantioseparation and Chiral Analysis of optically active compounds for Food Evaluation"</p> <p>This work provided simple and convenient analytical methods for optically active compounds such as chiral amino acids and organic acids for evaluation of authenticity and quality of foods. The present chiral ligand exchange capillary electrophoresis with a dual central metal ion method enabled simultaneous enantioseparation and determination for mixtures of chiral compounds. Chiral NMR shift reagents were also devised for simple in situ chiral analyses.</p>	(1)	Shuji Kodama Senichi Aizawa Atsushi Taga Tomohisa Yamashita Tomoko Kemmei Atsushi Yamamoto	Metal(II)-Ligand Molar Ratio Dependence of Enantioseparation of Tartaric Acid by Ligand Exchange Capillary Electrophoresis with Cu(II) and Ni(II)-D-Quinic Acid Systems	Electrophoresis	Vol.31, Iss.6	1051-1054	Mar. 2010	http://onlinelibrary.wiley.com/doi/10.1002/elps.200900596/abstract	S	S
					(2)	Senichi Aizawa Shuji Kodama	Mechanism of Change in Enantiomer Migration Order of Enantioseparation of Tartaric Acid by Ligand Exchange Capillary Electrophoresis with Cu(II) and Ni(II)-D-Quinic Acid Systems	Electrophoresis	Vol.33, Iss.3	523-527	Feb. 2012	http://onlinelibrary.wiley.com/doi/10.1002/elps.201100512/abstract		
					(3)	Shuji Kodama Senichi Aizawa Atsushi Taga Yoshitaka Honda Kentarō Suzuki Tomoko Kemmei Kazuichi Hayakawa	Determination of α -Hydroxy Acids and their Enantiomers in Fruit Juices by Ligand Exchange Capillary Electrophoresis with a Dual Central Metal Ion System	Electrophoresis	Vol.34, Iss.9-10	1327-1333	May. 2013	http://onlinelibrary.wiley.com/doi/10.1002/elps.201200645/abstract		
36	EAC	5402	Polymer/ Textile materials	<p>"Characterization of polymer materials by the analysis of water structure in the vicinity of their surface"</p> <p>Analyses of water in the vicinity of polymer materials will provide new facets in the characterization of the materials. Based on this concept, we have been analyzing the structure of water (1) in aqueous polymer solutions, (2) at the interfaces of liquid water and polymer materials, and (3) within polymer matrices. In addition, adsorption, freezing, and melting processes of water molecules adsorbed to polymer materials, which very often induce a decrease in mechanical strength of the materials, have been analyzed by using temperature-variable infrared spectroscopy.</p>	(1)	Makoto Gemmei-Ide Atsushi Ohya Hiromi Kitano	Thermally Latent Water in a Polymer Matrix	The Journal of Physical Chemistry B	Vol.114, No.12	4310-4312	Mar. 2010	http://pubs.acs.org/doi/abs/10.1021/jp101019q	S	S
					(2)	Makoto Gemmei-Ide Atsushi Ohya Hiromi Kitano	Recrystallization of Water in Non-Water-Soluble (Meth)Acrylate Polymers is Not Rare and is Not Devitrification	The Journal of Physical Chemistry B	Vol.116, No.6	1850-1857	Jan. 2012	http://pubs.acs.org/doi/abs/10.1021/jp211473p		
					(3)	Takuya Kondo Kouji Nomura Makoto Gemmei-Ide Hiromi Kitano Hidenori Noguchi Kohei Uosaki Yoshiyuki Saruwatari	Structure of water at zwitterionic copolymer film-liquid water interfaces as examined by the sum frequency generation method	Colloids and Surfaces B: Biointerfaces	Vol.113	361-367	Jan. 2014	http://www.sciencedirect.com/science/article/pii/S0927776513005778		
37	EAC	5302	Synthetic chemistry	<p>"Novel Carbon-Carbon Bond Forming Reactions by Allylpalladium Intermediates Possessing Silyl, Boryl, or Stannyl group"</p> <p>π-Allylpalladium is usually recognized to serve as synthetically useful electrophilic allylating agents toward many nucleophiles. On the other hand, σ-allylpalladium possessing ligands that donate electrons acts as nucleophilic allylating agents toward electrophiles. We demonstrated the distinct reactivities of allylic gem-palladium/metalloid species that cannot be reached by hitherto reported allylpalladium species.</p>	(1)	Yoshikazu Horino Naoki Homura Kana Inoue Saori Yoshikawa	Cyclopropanation of Strained Alkenes by Palladium-Catalyzed Reaction of 3-Trimethylsilyl- or 3-Pinacoloboryl-1-arylallyl Acetates	Advanced Synthesis & Catalysis	Vol.354, Iss.5	828-834	Mar. 2012	http://onlinelibrary.wiley.com/doi/10.1002/adsc.201100806/abstract	S	S
					(2)	Yoshikazu Horino Yu Takahashi Ryota Kobayashi Hitoshi Abe	Palladium-Catalyzed Cyclopropanation of Strained Alkenes with 3-Pinacoloboryl-1-arylallyl Carboxylates	European Journal of Organic Chemistry	Vol.2014, Iss.35	7818-7822	Dec. 2014	http://onlinelibrary.wiley.com/doi/10.1002/ejoc.201403284/abstract		
					(3)	Yoshikazu Horino Yu Takahashi Kaori Koketsu Hitoshi Abe Kiyoshi Tsuge	Practical and Convenient Synthesis of 1,6-Di- or 1,2,5,6-Tetra-arylhexa-1,3,5-trienes by the Dimerization of Pd(0)-Complexed Alkenylcarbenes Generated from π -Allylpalladium Intermediates	Organic Letters	Vol.16, No.12	3184-3187	Jun. 2014	http://pubs.acs.org/doi/abs/10.1021/ol501643x		

No.	Ref.	Dept.	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Environmental Applied Chemistry							Acad.	Soc. Sci.
						Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL		
38	EAC	6003	Catalyst/Resource chemical process	<p>"Direct Synthesis of Dimethyl Ether (DME)"</p> <p>Generally catalysis reaction need multiple reaction steps to obtain final target products. Here we invent a new concept "capsule catalyst" which can fulfill several catalysis reactions by one-step.</p> <p>As an application of capsule catalyst, DME synthesis directly from CO+CO₂+H₂ via methanol is accomplished by a tailor-made capsule catalyst.</p>	(1) Jian Sun Guohui Yang Qinqiang Ma Issei Ooki Akira Taguchi Takayuki Abe Qqing Xie <u>Yoshiharu Yoneyama</u> <u>Noritatsu Tsubakii</u>	Fabrication of active Cu-Zn nanoalloys on H-ZSM5 zeolite for enhanced dimethyl ether synthesis via syngas	Journal of Materials Chemistry A	Vol.2	8637-8643	Mar. 2014	http://pubs.rsc.org/en/Content/ArticleLanding/2014/TA/c3ta14936f#divAbstract	S	S	
					(2) Jian Sun Guohui Yang <u>Yoshiharu Yoneyama</u> <u>Noritatsu Tsubaki</u>	Catalysis Chemistry of Dimethyl Ether Synthesis	ACS Catalysis	Vol.4, No.10	3346-3356	Aug. 2014	http://pubs.acs.org/doi/abs/10.1021/cs500967j			
39	EAC	5201	Physical chemistry	<p>"Theoretical Study of Structure, Spectroscopy, and Transport at Liquid Interfaces"</p> <p>We have elucidated some physicochemically important issues on molecular structures, interface-selective vibrational spectra (sum frequency generation spectrum), and mass and energy transfer pertinent to condensation and evaporation at liquid (aqueous) interfaces. These issues are of critical importance in many fields such as stability of biomolecules, atmospheric reaction processes, bubble dynamics, and so on. This is the only theoretical study to address the above issues at liquid interfaces comprehensively in the world.</p>	(1) <u>Tatsuya Ishiyama</u> Takako Imamura Akihiro Morita	Theoretical Studies of Structures and Vibrational Sum Frequency Generation Spectra at Aqueous Interfaces	Chemical Reviews	Vol.114, No.17	8447-8470	2014	http://pubs.acs.org/doi/abs/10.1021/cr4004133	S	S	
					(2) <u>Tatsuya Ishiyama</u> Shigeo Fujikawa Thomas Kurz Werner Lauterborn	Nonequilibrium Kinetic Boundary Condition at the Vapor-Liquid Interface of Argon	Physical Review E	Vol.88, Iss.4	042406 (16pages)	Oct. 2013	http://journals.aps.org/pre/abstract/10.1103/PhysRevE.88.042406			
					(3) <u>Tatsuya Ishiyama</u> Akihiro Morita Tahei Tahara	Molecular Dynamics Study of Two-Dimensional Sum Frequency Generation Spectra at Vapor/Water Interface	The Journal of Chemical Physics	Vol.142, Iss.21	212407 (13pages)	2016	http://aip.scitation.org/doi/10.1063/1.4914299			

No.	Ref.	D e p t .	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Materials Science and Engineering							A c a d .	S o c i a l
						Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL		
40	MS	5905	Material processing/ Microstructural control engineering	"Research of nano structure analysis for nano-sized intermetallic compounds and precipitation in aluminum alloys" Our best results of research for nanoscaled precipitates in aluminum alloys have accelerated development and innovation of aluminum alloys from aluminum frames to parts of vehicles which need more higher specification from Toyama to the world. The relationship between precipitation, phase transformation, nano-structure, and mechanical and physical properties have been investigated by high resolution transmission electron microscopy to create new hyper aluminum alloys.	(1) Calin D. Marioara Junya Nakamura <u>Kenji Matsuda</u> Sigmund J. Andersen Randi Holmestad Tatsuo Sato Tokimasa Kawabata <u>Susumu Ikeno</u>	HAADF-STEM study of β' -type precipitates in an over-aged Al-Mg-Si-Ag alloy	Philosophical Magazine	Vol.92, Iss.9	1149-1158	2012	http://www.tandfonline.com/doi/abs/10.1080/14786435.2011.642319	SS	SS	
41	MS	5901	Physical properties of metals/ Metalbase materials	"Development of an industrial evaluation technique for vacancy behavior using muon spin relaxation method" This research project has been carried out as an international collaboration among members from University of Toyama, RIKEN Nishina center for accelerator-based science, Norwegian University of Science and Technology, and Rutherford-Appleton Laboratory. This is a quite unique approach by muon spin relaxation spectroscopy to explore aging hardening phenomena of Al-Mg-Si alloys which are expected to be useful materials to manufacture light weight vehicles. Research outcomes are useful to develop a proper manufacturing process in aluminum industry. In the Japan Institute of light Metals, a special research division for an industrial use of the muon spin relaxation method has been established.	(1) Sigurd Wenner <u>Katsuhiko Nishimura</u> <u>Kenji Matsuda</u> Teichiro Matsuzaki Dai Tomono Francis L. Pratt Calin D. Marioara Randi Holmestad	Muon kinetics in heat treated Al (-Mg)(-Si) alloys	Acta Materialia	Vol.61, Iss.16	6082-6092	Sep. 2013	http://www.sciencedirect.com/science/article/pii/S1359645413004953	S	S	
					(2) Sigurd Wenner Randi Holmestad <u>Kenji Matsuda</u> <u>Katsuhiko Nishimura</u> Taichiro Matsuzaki Dai Tomono Francis L. Pratt Calin D. Marioara	Probing defects in Al-Mg-Si alloys using muon spin relaxation	Physical Review B	Vol.86, Iss.10	104201 (7pages)	Sep. 2012	http://journals.aps.org/prb/abstract/10.1103/PhysRevB.86.104201			
42	MS	5902	Inorganic materials/ Physical properties	"Soft deposition method and direct patterning technique for ceramics thin films and new materials for battery" Growth conditions of YSZ and CeO2 thin films which were grown from aqueous solution and crystallized at relatively in low annealing temperature were established. Surface morphology of the specific areas in the YSZ thin films were controlled by applying the pulsed electrical fields at the film deposition and they will be a new patterning technique. On the other hand new Na based materials instead of Li for battery which was stable, safe and reacted rapidly are also investigated.	(1) <u>Atsushi Saiki</u> C.Kawai <u>Takashi Hashizume</u> K.Terayama	Growth Condition of CeO2 Thin Films Grown on Glass Substrate from Aqueous Solution and Their Optical Property	Materials Science and Engineering	Vol.18	32011	2011	http://iopscience.iop.org/article/10.1088/1757-899X/18/3/032011/meta;jsessionid=F0AD3F996E966359CE50063AEBBE64B8.c4.iopscience.cld.iop.org	S	S	
					(2) <u>Atsushi Saiki</u> Kento Hamada <u>Takashi Hashizume</u>	Surface morphology of YSZ thin films deposited from a precursor solution under the electrical fields	Innovative Processing and Manufacturing of Advanced Ceramics and Composites II: Ceramic Transactions	Vol.243	193-199	Mar. 2014	http://onlinelibrary.wiley.com/doi/10.1002/9781118771464.ch20/summary;jsessionid=CEC9A17D91CC329F27B9AB0468E1C30C.f04t01			
					(3) M.Matsunami <u>Takashi Hashizume</u> <u>Atsushi Saiki</u>	Ion-Exchange Reaction of A-Site in A ₂ Ta ₂ O ₆ Pyrochlore Crystal Structure	Archives of Metallurgy and Materials	Vol.60, Iss.2	941-944	Aug. 2015	https://www.degruyter.com/view/i/amm.2015.60.issue-2/amm-2015-0234/amm-2015-0234.xml			
43	MS	5903	Composite materials/ Surface and interface engineering	"Study on the friction stir welding of aluminum alloys" A series of these research works was originated from the joint research with the University of Toronto, Canada. The main subject we have been working on is the friction stir welding that has become a generic technology for joining light metals nowadays. We have made clear the deformation process of friction stir welding with a single crystal pure aluminum, characteristics of peculiar microstructures of several aluminum alloys, aluminum based composite materials and steels that are friction stir welded. These research outputs offered key scientific bases to understand the FSW in terms of materials science.	(1) Tohid Saeid Amir Abdollah-zadeh <u>Toshiya Shibayanagi</u> Kenji Ikeuchi Hamid Assadi	On the formation of grain structure during friction stir welding of duplex stainless steel	Materials Science & Engineering: A	Vol.527, Iss.24-25	6484-6488	Sep. 2010	http://www.sciencedirect.com/science/article/pii/S0921509310007367	S	SS	
					(2) Essam R.I. Mahmoud Makoto Takahashi <u>Toshiya Shibayanagi</u> Kenji Ikeuchi	Wear characteristics of surface-hybrid-MMCs layer fabricated on aluminum plate by friction stir processing	Wear	Vol.268, Iss.9-10	1111-1121	Mar. 2010	http://www.sciencedirect.com/science/article/pii/S0043164810000062			
					(3) Adrian P. Gerlich <u>Toshiya Shibayanagi</u>	Liquid film formation and cracking during friction stir welding	Science and Technology of Welding & Joining	Vol.16, Iss.4	295-299	2011	http://dx.doi.org/10.1179/1362171811Y.0000000005			

No.	Ref.	Dept.	KAKEN No.	KAKEN section	Research subject & Abstract	Research papers / Materials Science and Engineering							Acad.	Soc. Sci.
						Authors	Title	Journal	Vol., No.	Pages	Published month, year	URL		
44	MS	5905	Material processing/ Microstructural control engineering	<p>"Study of light metals materials and casting process for light weighting and high function"</p> <p>This study is the theme that author work on now from the company era before coming to Toyama University. Industrial result of this study includes following three.</p> <p>①Case of the latest mobile PC of the major electric equipment apparatus maker ②Engine part of the practical use sportscar of the major car maker ③Casting technology development of the complicated shape part production of the commercial airplane.</p> <p>In a part of above results placed in the official journal of a scientific society as an article, and patent application and registration have been carried out. This fact shows that this study is full of novelty in worldwide industrial use.</p>	(1)	Seiji Saikawa Yasuhiro Shigenaga Hiroshi Yamada Susumu Ikeno	Effect of Aluminum content on the Age Hardning Behavior of the Mg-Al-Mn System Alloys Cast by Permanent Mold	Journal of Smart Processing	Vol.4	122-128	2015	https://www.istage.ist.go.jp/article/ispmee/4/2/4.122/article-char/ia/	S	SS
					(2)	Seiji Saikawa Yuhei Ebata Kiyoshi Terayama Susumu Ikeno Emi Yanagihara	Age-Hardening Behavior of Mg-Al-Zn Alloys Produced by Sand Mold Casting	Materials Science Forum	Vol.783-786	467-471	May. 2014	https://www.scientific.net/MSF.783-786.467		
					(3)	Seiji Saikawa G. Aoshima Susumu Ikeno K.Morita N.Sunayama Koichi Komai	Microstructure and Mechanical Prooerties of an Al-Zn-Mg-Cu Alloy Produced by Gravity Casting Process	Archives of Metallurgy and Materials	Vol.60, Iss.2	871-874	Jun. 2015	https://www.degruyter.com/view/i/amm.2015.60.issue-2/amm-2015-0221/amm-2015-0221.xml		
45	MS	5904	Structural/ Functional materials	<p>"Study of degradation of the corrosion resistance by segregation of solute atom around grain boundary and dislocation"</p> <p>We focus on the solute segregation and precipitation around precipitate / matrix interface and dislocations which are thought to be origin of corrosion in various structural metals. These changes of chemical composition in narrow region usually affect corrosion parameters such as corrosion potential and corrosion potential. We evaluate these parameters using by our original electrochemical methods. Recent our study on stainless steels and evaluation of rust prevention ability of oils gave important results.</p>	(1)	Masahiko Hatakeyama I. Yamagata Satoshi Tamura	Direct observation of solute-dislocation interaction on screw dislocation in a neutron irradiated modified 316 stainless steel	Materials Letters	vol.122	301-305	May. 2014	http://www.sciencedirect.com/science/article/pii/S0167577X14001256	SS	SS
					(2)	Yosuke Ishibashi Masateru Nose Masahiko Hatakeyama Satoshi Sunada	Effects of Aluminum Sputtering on the Corrosion Resistance of AZ91 Alloy	Archives of Metallurgy and Materials	vol.60(2A)	953-955	Jul. 2015	https://www.degruyter.com/view/i/amm.2015.60.issue-2/amm-2015-0237/amm-2015-0237.xml?format=INT		
					(3)	Daisuke Iwashima Sayaka Hirata Naoki Nagase Masahiko Hatakeyama Satoshi Sunada	Rust Preventive Properties by Using Polarization Curve Measurement on the Metal Coated with the Rust Preventive Oil	Materials Transactions	vol.55	1762-1764	2014	https://www.istage.ist.go.jp/article/matertrans/55/11/55.MAW201417/article		
46	MS	5902	Inorganic materials/ Physical properties	<p>"Research for New Type Battery"</p> <p>This research project has been carried out for development new cathode materials for Na ions battery instead of Li ions. It was found that their structural stability, reaction rate, safety were sufficient and they have great potential to be used as battery materials.</p>	(1)	M.Matsunami Takashi Hashizume Atsushi Saiki	Ion-Exchange Reaction of A-Site in A ₂ Ta ₂ O ₆ Pyrochlore Crystal Structure	Archives of Metallurgy and Materials	vol.60	941-944	Jun. 2015	https://www.degruyter.com/view/i/amm.2015.60.issue-2/amm-2015-0234/amm-2015-0234.xml?format=INT	S	S