

List of selected projects for General Collaborative Research Project 2018, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member	Institution
J18I001	Development of Light-driven Micro/Nano Fluidic Devices	Noboru Yamada	Nagaoka University of Technology	Atsuki Komiya	Tohoku University
J18I002	Experimental study on structural shape of conductive tether for removing space debris	Kanjuro Makihara	Tohoku University	Kiyonobu Ohtani	Tohoku University
J18I003	Effects of heat loss on the dynamics of hydrogen-air premixed flames	Satoshi Kadowaki	Nagaoka University of Technology	Hideaki Kobayashi	Tohoku University
J18I004	Nondestructive evaluation for carbon fiber composite parts fabricated by prepreg with high moldability	Mizukami Koichi	Ehime University	Hiroyuki Kosukegawa	Tohoku University
J18I006	Application of low-temperature sensitive fast response PSP on low-speed unsteady flow and its validation	Yasuhiro Egami	Aichi Institute of Technology	Hiroki Nagai	Tohoku University
J18I007	Radical Transportation to Complex Shapes by Non-Vacuum Plasma Jet Flow	Ryuta Ichiki	Oita University	Takeru Okada	Tohoku University
J18I008	Impact of negative temperature coefficient behavior on autoignition and pressure wave generation during knocking combustion	Hiroshi Terashima	Hokkaido University	Hisashi Nakamura	Tohoku University
J18I009	Exploitation of deployable wing model fusing interdisciplinary fields: fluid/structure/control	Kanjuro Makihara	Tohoku University	Hiroki Nagai	Tohoku University
J18I011	Fluid flow analysis of an atmospheric-pressure micro-plasma ejected from a narrow nozzle	Hiroyuki Yoshiki	National Institute of Technology, Tsuruoka College	Takehiko Sato	Tohoku University
J18I012	Acoustic fluid analysis on edge tone	Kin'ya Takahashi	Kyushu Institute of Technology	Yuji Hattori	Tohoku University
J18I013	Investigation of bioheat transfer characteristics of skin tumor during non-invasive measurement of thermal conductivity	Takahiro Okabe	Hirosaki University	Junnosuke Okajima	Tohoku University
J18I015	Numerical Analysis on Supersonic Flow Control using High Repetitive Laser Pulses	Akira Iwakawa	Nagoya University	Shigeru Obayashi	Tohoku University
J18I016	Control of Electronic Band Structure of Quantum Nanodisks for High-Efficiency solar cells and Laser applications	Atsuhiko Fukuyama	Miyazaki University	Seiji Samukawa	Tohoku University
J18I019	Internal defect of plastic-fabricated Carbon Fiber Reinforced Thermo Plastics	Noboru Nakayama	Shinsyu University	Takagi Toshiyuki	Tohoku University
J18I020	Study on the function of Me-DLC nano-composite coatings acting as thermo-sensor in the sliding interface	Minoru Goto	National Institute of Technology, Ube College	Takagi Toshiyuki	Tohoku University
J18I021	Accurate/Efficient Uncertainty Quantification for Tsunami Inundation Flows	Ayumu Yamazaki	Nagaoka University of Technology	Koji Shimoyama	Tohoku University

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J18I022	Experimental and Numerical Study on Improvement of Flight Performance of a Multicopter	Daisuke Sasaki	Kanazawa Institute of Technology	Koji Shimoyama	Tohoku University
J18I026	Research on surface modification of OLED materials via neutral beam technology	Chang Xijiang	Shanghai University of Engineering Science	Seiji Samukawa	Tohoku University
J18I027	Application of nanostructure surfaces to enhance the thermal performance of heat pipe	Zhang Peng	Shanghai Jiao Tong University	Hiroki Nagai	Tohoku University
J18I028	Mixture of Experts in Bayesian Optimization for Complex Aerospace Designs	Rhea Liem	Hong Kong University of Science and Engineering (HKUST)	Koji Shimoyama	Tohoku University
J18I029	Discharge phenomenon in laser-induced bubble and formation mechanism of microjet by cavitation bubble	Takehiko Sato	Tohoku University	FARHAT Mohamed	Ecole Polytechnique Federale de Lausanne (EPFL)
J18I030	Thermodynamic Property Gradients in Near-Surface Water Thin Film and its Impact on Liquid Flow in Microlayer	Shalabh C. Maroo	Syracuse University	Takashi Tokumasu	Tohoku University
J18I031	Multipoint Wind Turbine Blade Optimization by Utilizing Gradient Information for Maximum Power Coefficient	Lavi Rizki Zuhail	Bandung Institute of Technology	Koji Shimoyama	Tohoku University
J18I032	Coupled analysis of high-density hydrogen safety management	Jun Ishimoto	Tohoku University	Combescure, Alain	INSA de Lyon
J18I034	Estimation of fracture permeability by integrating microseismic observational data and reservoir engineering modeling.	Yusuke Mukuhira	Tohoku University	Justin Rubinstein	United States Geological Survey
J18I035	Analysis of oxygen transport resistance in catalyst layer of polymer electrolyte fuel cell based on molecular scattering phenomena	Takashi Tokumasu	Tohoku University	Kinefuchi Ikuya	Tokyo University
J18I036	The Role of Signal-anchor Region of Type II Transmembrane Protein in Subcellular Localization	Yuri Mukai-Ikeda	Meiji University	Makoto Ohta	Tohoku University
J18I037	Development of brain-like memory integrated systems and stacked analog memory devices	Takashi Morie	Kyushu Institute of Technology	Seiji Samukawa	Tohoku University
J18I038	Design optimization of reusable booster stage of two-stage-to-orbit in view of aerodynamics, structural dynamics, and aerothermodynamics	Kazuhisa Chiba	The University of Electro-Communications	Shigeru Obayashi	Tohoku University
J18I040	Interferometric measurement of temperature fields in turbulent flows	Juan Felipe Torres	Australian National University	Atsuki Komiya	Tohoku University
J18I041	Analysis of transport phenomena of oxygen ion in dual-phase electrolyte material	Takashi Tokumasu	Tohoku University	Jeongmin Ahn	Syracuse University
J18I042	Investigation of centreline shock reflection and viscous effects in axisymmetric supersonic flow	Hideaki Ogawa	RMIT University	Kiyonobu Ohtani	Tohoku University

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J18I044	Mechanism of thermal energy transfer in nanoscale solid-liquid systems	Taku Ohara	Tohoku University	Masahiko Shibahara	Osaka University
J18I045	Estimation of mechanical properties of living tissue by shock wave irradiation	Tokitada Hashimoto	Saga University	Kiyonobu Ohtani	Tohoku University
J18I046	Seminar for Advanced Maintenance Technology of Fiber Reinforced Composites	Takagi Toshiyuki	Tohoku University	Hiroshi Ito	Yamagata University
J18I047	Solid Oxide Fuel Cells Replacement of a Traditional Catalytic Converter	Jeongmin Ahn	Syracuse University	Hisashi Nakamura	Tohoku University
J18I048	Retrospective study of intracranial aneurysms treated with flow-diverting stent: the correlation between haemodynamic alterations and treatment outcomes	Makoto Ohta	Tohoku University	Itsu Sen	Macquarie University
J18I050	Evaluation of Thermal Flow Field in Closed Cavity under Temporally Variable Thermal Condition	Atsuki Komiya	Tohoku University	Nicholas Williamson	The University of Sydney
J18I053	Study on Fracture Behaviour of Single Natural Fiber	FUADI Zahrul	Syiah Kuala Univeristy	Takagi Toshiyuki	Tohoku University
J18I054	Micro combustion for clean and efficient syngas formation and fuel cell applications	Jeongmin Ahn	Syracuse University	Kaoru Maruta	Tohoku University
J18I055	Modelling materials behavior for advanced electromagnetic Non Destructive Testing techniques	SEBALD Gael	ELyTMaX, CNRS – Univ. Lyon, Tohoku Univ	Tetsuya Uchimoto	Tohoku University
J18I056	Mathematical modeling and simulations of soft-elastic materials under large strain	Jean-YvesCavaille	ELyTMaX	Takagi Toshiyuki	Tohoku University
J18I057	Combustion characteristics of biogas at various pressures	Willyanto Anggono	Petra Christian University	Akihiro Hayakawa	Tohoku University
J18I058	Magnetic and Electric Properties of Diamond Like Carbon-Magnetic Metal Nano-composite Films	Hiroyuki Kosukegawa	Tohoku University	Zhang Yiwen	Tianjin University
J18I059	Nanostructured Heusler alloys and related compounds prepared by mechanical alloying and plasma electrolytic methods for energy saving thermoelectric power generation and protective coatings	Vladimir Khovaylo	National University of Science and Technology "MISIS"	Takagi Toshiyuki	Tohoku University
J18I061	Evaluation of the fluid dynamical effects on in-flight polymeric particle behavior during Cold-Spray	BERNARD Chrystelle	Frontier Research Institute for Interdisciplinary Sciences	Hidemasa Takana	Tohoku University
J18I062	Kinetic modeling of high-pressure surface ionization waves generated by ns pulse discharges	Hidemasa Takana	Tohoku University	Adamovich Igor	The Ohio State University
J18I065	A study on flow characteristics of suspensions of surface-modified nanoparticles using numerical simulations	Takao Tsukada	Tohoku University	Atsuki Komiya	Tohoku University

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J18I066	Corrosion characterization for pipe wall by electromagnetic ultrasound	Hiroyuki NAKAMOTO	Kobe University	Takagi Toshiyuki	Tohoku University
J18I067	A study on the functionality improvement of nanoparticulate-filled carbon fiber reinforced plastic	Tetsuo Takayama	Yamagata University	Hiroyuki Kosukegawa	Tohoku University
J18I068	Mechanism of inception and propagation of underwater streamer	Takehiko Sato	Tohoku University	KANAZAWA Seiji	Oita University
J18I070	Clarification of the transition mechanism of cavitation instabilities	Donghyuk Kang	Aoyama Gakuin University	Yuka Iga	Tohoku University
J18I071	Numerical Investigation of Dynamic Stability for the High-Altitude Experimental Model of Martin Airplane	Masahiro Kanazaki	Tokyo Metropolitan University	Hiroki Nagai	Tohoku University
J18I072	Development of Molecular Imaging Technology for Investigation of Projectile Aerodynamics	Daiju Numata	Tokai University	Kiyonobu Ohtani	Tohoku University
J18I075	Characteristics of high enthalpy flows around a hypersonic vehicle	Gouji Yamada	Tokai University	Kiyonobu Ohtani	Tohoku University
J18I078	Fluid dynamics and energy/scalar transport in coexisting flow of turbulence and non-turbulence	Yasuhiko Sakai	Nagoya University	Toshiyuki Hayase	Tohoku University
J18I081	Effect of environment attenuation of underwater explosion by porous complex mediums	Kazutaka Kitagawa	Aichi Institute of Technology	Kiyonobu Ohtani	Tohoku University
J18I082	Experimental Study on Unsteady Aerodynamic Characteristics of a Badminton Shuttlecock	Hiroaki Hasegawa	Utsunomiya University	Hiroki Nagai	Tohoku University
J18I083	Elucidation of Fluid Phenomena and its Application to Sports Fields	Hiroaki Hasegawa	Utsunomiya University	Shigeru Obayashi	Tohoku University
J18I084	Atomizing characteristics of superheated water injected from a fan spray nozzle	Rikio Watanabe	Tokyo City University	Hideaki Kobayashi	Tohoku University
J18I085	Investigation of a time response of cntTSP sensor for a dynamic visualization of the laminar-to-turbulent boundary layer transition	Daisuke Yorita	German Aerospace Center - DLR	Hiroki Nagai	Tohoku University
J18I086	Development of Conservative Kinetic Force Method Near Equilibrium	Vladimir Saveliev	Institute of Ionosphere, National Center of Space Researches and Technologies	Shigeru Yonemura	Tohoku University
J18I089	Development of Aerodynamic and Propulsion System for High Performance Mars Exploration Aircraft	Shinkyu Jeong	Kyunghee University	Hiroki Nagai	Tohoku University
J18I090	Individual effects of plasma-generated electrical field, short-life species, and long-life species on cell	Yun-Chien Cheng	National Chiao Tung University	Takehiko Sato	Tohoku University

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Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member	Institution
J18I091	Characterization of Fatigue Damage using Electromagnetic NDT Methods	Zhenmao Chen	Xi'an Jiaotong University	Takagi Toshiyuki	Tohoku University
J18I092	The study on the Mechanism of Coupling Wall-Effect on Multidirectional Wings based on Multi-Objective Optimization	Chenguang Lai	Chongqing University of Technology	Shigeru Obayashi	Tohoku University
J18I093	Investigation of Nano-particle Additives in Bio-Lubricants using Molecular Dynamic Simulation	Takashi Tokumasu	Tohoku University	Nasruddin Yusuf Rodjali	Universitas Indonesia
J18I094	NBE-treated triboelectric Energy harvesters	Dukhyun Choi	Kyung Hee University	Seiji Samukawa	Tohoku University
J18I099	Development of Numerical Modeling on Enhancement of CO2 Absorption by Ionic Liquid Electrospray	Hidemasa Takana	Tohoku University	Takayasu Fujino	University of Tsukuba
J18I101	Surface Pressure Measurement over Free Flight Object in Ballistic Range Facility using Motion-Capturing Pressure-Sensitive Paint Method	Hiroataka Sakaue	University of Notre Dame	Hiroki Nagai	Tohoku University
J18I102	Study of coaxial inversion rotor aimed at realizing Mars helicopter	Hiroki Nagai	Tohoku University	Koichi Yonezawa	Central Research Institute of Electric Power Industry
J18I103	Stability and nonlinear dynamics of stably stratified vortices with hyperbolic stagnation points	Yuji Hattori	Tohoku University	Manish Khandelwal	Indira Gandhi National Tribal University
J18I104	The development and Applications of Pressure-Sensitive Paint on the Investigations of Gases Mixing in T-type Micromixers	Huang, Chih- Yung	National Tsing Hua University	Hiroki Nagai	Tohoku University
J18I105	Electronic structure of semiconductor nanostructure array for thermoelectric applications	Yiming Li	National Chiao- Tung University	Seiji Samukawa	Tohoku University
J18I108	Effect of Wall Elasticity on Reduction of Wall Shear Stress in a Patient-Specific Aneurysm model in Middle Cerebral Artery	Ryuhei Yamaguchi	Chiba University	Makoto Ohta	Tohoku University
J18I109	Analytical development of artificially modified bio-template for 2D ordered or dispersed nanoparticles etching array mask	Ichiro Yamashita	Osaka University	Seiji Samukawa	Tohoku University
J18I110	Estimation of thermal and transport properties of hydrogen/oxygen mixture employing an ab-initio method	Takashi Tokumasu	Tohoku University	Shinichi Tsuda	Kyusyu University

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List of selected projects for Exploratory Collaborative Research Project 2018, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member	Institution
J18H001	Comparison of data assimilation methods in fluid problems	Takashi Misaka	Tohoku University	Shigeru Obayashi	Tohoku University
J18H002	Study on the aerodynamic designs of wingtip device based on biomimetic technologies and its feature extraction of dominant flow modes	Seichiro Morizawa	Tottori University	Shigeru Obayashi	Tohoku University
J18H003	Aerodynamic drag reduction using a coating material in flapping wing	Tadateru Ishide	National Institute of Technology, Kisarazu College	Shigeru Obayashi	Tohoku University

3 selected projects

List of selected projects for  
International Multiple Collaborative Research Project 2018, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member (Institution)
J18R001	Link between tracer and microseismic analysis to comprehensive understanding of hydraulic feature of fractured geothermal reservoir	Anna Suzuki	Tohoku University	Roland N. Horne (Stanford University), Michael Fehler (MIT), Takuya Ishibashi (AIST), Peter Kang (University of Minnesota)
J18R002	Japan-US-French partnership for multi-scale dynamic modeling to optimize actual machine from molecular design	Shigeru Obayashi	Tohoku University	Ohuchi, Fumio (University of Washington), Anthony Waas (University of Washington), Christine K. Luscombe (University of Washington)
J18R003	Micro channel burners for energy production on the basis of micro combustion	Sergey Minaev	Far-Eastern Federal University	Kaoru Maruta (Tohoku University), Fursenko Roman (ITAM SBRAS), Gubernov Vladimir (Lebedev Physical Institute RAS), Kiryashkin Alexander (TSC)
J18R004	Instability and Nonlinear Dynamics of Curved Vortices	Yuji Hattori	Tohoku University	Stephane Le Dizès (IRPHE, Aix-Marseille University), Stefan Llewellyn Smith (UC SD), Ivan Delbende (LIMS), Maurice Rossi (Université de Paris VI), Yasuhide Fukumoto (Kyushu University)
J18R005	Piping sYstem, Risk management based on wall thinning MonItoring and preDiction (PYRAMID)	Takagi Toshiyuki	Tohoku University	Guy, Philippe (INSA de Lyon), Boller, Christian (Saarland University), Valeske, Bernd (IZFP, Fraunhofer Institute for NDT), Normand, Bernard (INSA-Lyon), Calmon, Pierre (CEA)
J18R006	Modeling of mixing of plasma species in atmospheric-pressure argon–steam arc discharge	Jiri Jenista	Institute of Plasma Physics ASCR, v.v.i.	Hidemasa Takana (Tohoku University), Murphy B. Anthony (CSIRO Materials Science and Engineering)

6 selected projects

List of selected projects for  
Priority Collaborative Research Project 2018, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member (Institution)
J18J001	Multiscale flow and interfacial transport phenomena at phase and material boundaries	Taku Ohara	Tohoku University	Kwak Dongyoun (JAXA), Hirotaka Sakaue (University of Notre Dame), Hirofumi Wada (Ritsumeikan University), Mitsuo Hashimoto (Nireco Co.), Takashi Iijima (AIST), Alain Combescure (INSA de Lyon), Lalita Udpa (Michigan State University), Bernd Valeske (IZFP)
J18J002	Science and technology for utilizations of carbon free energy carriers	Hideaki Kobayashi	Tohoku University	Nozomu Hashimoto (Hokkaido University), Dany Escudie (INSA-Lyon), Cedric Galizzi (INSA-Lyon), Olivier Emile Mathieu (Texas A&M University)

2 selected projects