

Division of Mathematical and Physical Sciences	Research field	Nonlinear Physics	Lab. ID
			MP13
Laboratory web site	<a href="http://nlab.w3.kanazawa-u.ac.jp/">http://nlab.w3.kanazawa-u.ac.jp/</a>		
Research subjects			
<p>We currently study nonlinear phenomena: (1) Nonlinear Energy Localization in Lattices, (2) Pattern formations in non-neutral Electron beams, and (3) Development of Terahertz Wave sources, by both experiments and simulations. (1) Lattice systems for localization studies are micro-mechanical systems, circuit lattices, and natural crystals. (2) Themes related to electron beams span from fundamental study of vortex to an application study such as compression of electron beams. (3) Terahertz projects cover generations and applications combined with lasers and spectrometers.</p>			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
<p>Students will be involved in several projects and later they will choose one of them as a final theme. They will be requested to read papers related to projects, plan experiments and present a summary at a seminar to lead him/herself to give a talk at Physical Meetings. Presenters at the seminar have to be good at plain explanations, because of variety of projects classified into different areas in Nonlinear physics, and because wide range of knowledge is required to understand all projects. We share problems by all members and make students to have wide perspective of fields.</p>			
Daily life in the laboratory, etc.			
<p>Coming every day, performing experiments and joining meetings are routine works. Sometimes students stay in the laboratory and spend their time freely. Sometimes we are busy to perform outreach activities such as Science Laboratory (undergraduate activity), University Open Campus, one day science class for high school students called Science Plaza, or High-School-&amp;-University joint activity. Students may be asked to help and join these short term activities. Students involved to Terahertz projects may visit High Energy Acceleration Facility about twice a year.</p>			
Message or comments by the laboratory faculty staffs			
<p>Graduate students will find themselves at a boundary of known and unknown regions in their study fields. Precise recipe to explore the unknown region may be given from their supervisor(s), however, it is better to have a power to push projects forward by their own ability. Anticipating next things at all time, and paying attention to development of projects will train students to have such abilities. Also communicating with supervisors well and presenting his/her ideas or thoughts to others are required to set up a leadership for moving projects forward.</p>			
Recent Master theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2017.3	Experimental study on the interaction between a vortex clump and a vortex hole produced by pure electron plasmas		
2017.3	Study on statistical temperature of 2D Euler fluid produced by pure electron plasmas		
2017.3	Study of Intrinsic Localized Mode by Mass Nonlinearity		
2017.3	Preliminary experiments on free electron maser with intense electron beams injected into a rectangular waveguide		
2016.3	Supertransmission of intrinsic localized mode and its related problems		
2016.3	Experimental study on beam propagation through parallel plates		
2016.3	Experiments on microwave radiation with an intense electron beam using a helical wiggler coil		
2016.3	Experimental study on 100GHz Backward-Wave Oscillator with newly developed slow wave circuit		
2016.3	Development of supertransmission of intrinsic localized mode		
2015.3	Characteristic Evaluation of Hybrid Bragg Resonators for n Intense Free Electron Maser		
2015.3	Study of Intense Electro-Magnetic Wave Oscillation by an Intense Electron Beam		
2015.3	Preparation and extension of a Terahertz spectrometer		
2015.3	Phase Space Dynamics of Two Discrete Vortices Composed of Pure Electron Plasmas		
2014.3	Experimental Study of a Free Electron Maser with Bragg Resonators		
2014.3	Experimental Study of Intrinsic Localized Modes in Large Scale Lattice with Saturable Nonlinearity		
2014.3	Pure Electron Plasma Experiments for Simulating Pulse Compression of Electron Beam		
2013.3	Propagation Characteristics of Intense Relativistic Electron Beam between Parallel Plates		
2013.3	Analysis of a Translational Bifurcation Mechanism of Intrinsic Localized Modes by Linear Response Measurements		
2013.3	Traveling Intrinsic Localized Modes in a Small Lattice and Their Analysis based on Nonlinear Schrödinger Model		
2013.3	Simulations of Symmetric Vortex Merger in a Background Vorticity Distribution		
2013.3	Experimental Study of a Millimeter Band Backward-Wave Oscillator with a Newly Developed Slow Wave Circuit		

Recent Doctoral theses in these 3 years (+ more if appropriate)	
year.month	Thesis title (including English translation of Japanese thesis title)
2016.3	Measurement of Surface Charging on Solid Insulation Materials in Vacuum
2014.9	Studies of Intrinsic Localized Modes in a Nonlinear Electric Lattice with Saturable Nonlinearity
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