

5th (2011) Young Scientist Award of the Physical Society of Japan

2011年物理学会若手奨励賞

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The Physical Society of Japan annually award young researchers for their excellent research accomplishments. Dr. T. Yamada and Dr. M. Hirota are selected as laureates of 5th Young Scientist Award of the Physical Society of Japan based on the recommendation of the selection committee in the division of plasma physics (division 2) chaired by Prof. S. Ishihara. We celebrate those two brilliant young physicists for their excellent accomplishments.

1. Introduction

The Physical Society of Japan annually awards young researchers for their excellent research accomplishments. The division of plasma physics (division 2) has formed selection committee in Aug. 2010 chaired by Prof. S. Ishihara whose members are shown in Table 1.

Table 1 Selection committee for 5th Young Scientist Award of the Physical Society of Japan, Division of Plasma Physics.

	Name	Affiliation
Chair	Prof. S. Ishihara	Yokohama National University
Vice Chair	Dr. M. Kikuchi	JAEA
Member	Prof. K. Mima	The Graduate School for the Creation of New Photonics Industries
Member	Prof. M. Taguchi	Nihon University
Member	Prof. K. Yamazaki	Nagoya University
Member	Prof. T. Maekawa	Kyoto University

The committee made extensive evaluation of candidate young researchers and recommended Dr. T. Yamada (Graduate School of Frontier Science, The University of Tokyo) and Dr. M. Hirota (Fusion Research and Development Directorate, JAEA) as candidates of 5th (2011) Young Scientist Award to Board of Directors of the Physical Society of Japan and was approved.

Brief introduction of committee evaluation are shown as follows,

2. Dr. Takuma Yamada [Experimental Research on drift wave – streamer system in linear magnetized plasma]

Dr. T. Yamada has contributed to the understanding of physics of strong drift wave turbulence, which is focus of transport problems of fusion plasma. He verified experimentally the mechanism of structure formation due to nonlinear interactions predicted by theory and simulation. Experimental verification of the streamer and the nonlinear coupling between modes is a major breakthrough in the study of plasma turbulence, which will be expected to develop further research in conjunction with theoretical studies. The research is highly regarded as world-leading research.

Published Papers for this Award

- [1] T. Yamada, S.-I. Itoh, T. Maruta, N. Kasuya, Y. Nagashima, S. Shinohara, K. Terasaka, M. Yagi, S. Inagaki, Y. Kawai, A. Fujisawa and K. Itoh, *Nature Phys.* **4**, 721-725 (2008). Two-dimensional bispectral analysis of drift wave turbulence in a cylindrical plasma,
[2] T. Yamada, S.-I. Itoh, S. Inagaki, Y. Nagashima, S. Shinohara, N. Kasuya, K. Terasaka, K. Kamataki, H. Arakawa, M. Yagi, A. Fujisawa and K. Itoh, *Phys. Plasmas* **17**, 052313-1-10 (2010). Two-dimensional bispectral analysis of drift wave turbulence in a cylindrical plasma
[3] T. Yamada, S.-I. Itoh, S. Inagaki, Y. Nagashima, S. Shinohara, N. Kasuya, K. Terasaka, K. Kamataki, H. Arakawa, M. Yagi, A. Fujisawa and K. Itoh, *Plasma Fusion Res.* **5** S2016 (2010). Nonlinear Mode Couplings in a Cylindrical Magnetized Plasma.

3. Dr. Makoto Hirota [Theory of action-angle variables for continuous spectrum in flowing plasma]

Dr. M. Hirota proposed a new analytical method for the wave analysis of the flowing plasma and has contributed to the development of MHD fluctuation studies in fusion plasmas as well Astrophysical Plasmas. In particular, the interaction of singular eigenmode (van Kampen modes) and the wave in the phase space leading to the dissipation and amplification of wave (Landau resonance for example) have been formulated mathematically as well as the analysis of ideal MHD wave with flow. The successful formulation is highly appreciated. We look forward further development of the theory by the candidate and deemed appropriate as Young Scientist Award.

Published Papers for this Award

- [1] M. Hirota and Y. Fukumoto: *Journal of Mathematical Physics* Vol. 49, 083101 (2008). "Energy of hydrodynamic and magnetohydrodynamic waves with point and continuous spectra"
[2] M. Hirota and Y. Fukumoto, *Physics of Plasmas* Vol. 15, 122101 (2008). "Action-angle variables for the continuous spectrum of ideal magnetohydro-dynamics"
[3] M. Hirota and S. Tokuda, *Physics of Plasmas*, Vol 17, 082109 (2010), "Wave-action conservation law for eigenmodes and continuum modes"