

# 国台学术报告 NAOC COLLOQUIUM

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## A self-consistent turbulence model for explosive magnetic reconnection



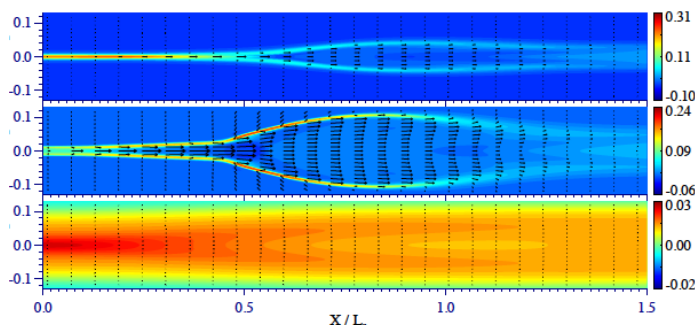
**Prof. Nobumitsu YOKOI (University of Tokyo)**

Dr. Nobumitsu YOKOI is an assistant Professor at the Institute of Industrial Science, University of Tokyo. He obtained his Ph.D. in University of Tokyo in 1995. He is a Visiting Researcher at National Astronomical Observatory of Japan and the Nordic Institute for Theoretical Physics (NORDITA) since 2009. One of his main research interests is the hydrodynamic and magnetohydrodynamic turbulence.

### Abstract

In order to obtain a fast magnetic reconnection we need some mechanisms that enhance the effective magnetic diffusivity. Turbulence is considered to be one of such candidates. Focusing on the turbulence effects in the mean magnetic-field evolution, we construct a

system of turbulence model, where the turbulent evolution is solved through the transport equations of several turbulent statistical quantities, in addition to the mean-field equations for the density, momentum, and energy. Numerical results showed that a slow laminar-like reconnection for very weak turbulence, and just a turbulent diffusion of the mean magnetic field (no fast reconnection) for too much turbulence. Another interesting point is the role of the cross helicity (velocity--magnetic-field correlation). The dynamic balance between the transport enhancement and suppression due to turbulence, the turbulent cross helicity contributes to localization of the effective magnetic diffusivity, leading to a fast reconnection.



*All are welcome! Tea, coffee, biscuits will be served at 2:15 P.M.*

You are welcome to nominate speakers to Weimin Yuan (wmy@nao.cas.cn), Mei Zhang (zhangmei@bao.ac.cn), Licai Deng (licai@bao.ac.cn), Xuelei Chen (xuelei@cosmology.bao.ac.cn), Shude Mao (smao@nao.cas.cn)