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国台学术报告 NAOC COLLOQUIUM

2013 年 第 35 次 / Number 35, 2013

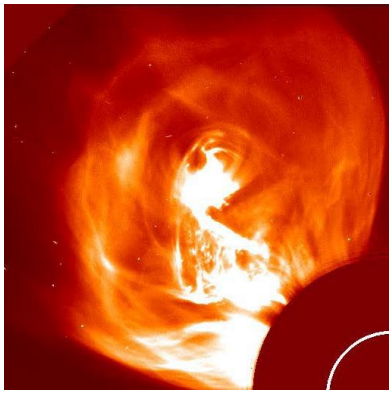
TIME: Monday, 2:30 PM, June 17, 2013 LOCATION: A601 NAOC

MHD Instabilities in Solar Eruptions

Prof. Bernhard Kliem (University of Potsdam, Germany)

Dr. Kliem received his PhD from the Academy of Sciences, Berlin in 1987 for an investigation of solar radio bursts. He then worked in the Astrophysical Institute Potsdam and its predecessor on various aspects of solar activity, including reconnection and particle acceleration in flares and MHD instabilities in coronal mass ejections. Most of his work is computational, but he has also been actively involved in observing flare-triggered coronal oscillations with the SUMER spectrometer onboard SOHO. In 2009 he moved to his current position as a Senior Research Associate at the University of Potsdam. He is also a honorary professor at the University College London/Mullard Space Science Laboratory and currently a visiting professor at the Yunnan Astronomical Observatory of the CAS in Kunming. His current interests focus mainly on the initiation of coronal mass ejections and the numerical study of their evolution..

Abstract



Solar eruptions are observed as prominence/filament eruptions, coronal mass ejections (CMEs) and flares, or as a subset of these. They cause the major perturbations of plasma and field in interplanetary space known as Space Weather. A number of models for the eruptions have been competing in the past two decades, but consensus is growing that these can be grouped into two principal categories, flux rope models with an ideal-MHD instability, or catastrophe, being the dominant process and arcade models with magnetic reconnection being dominant; even these two categories possess common aspects. I will introduce the basic concepts in modeling the eruptions, focusing on two instabilities which, at least in the first category, appear to be key to their initiation and main drive -- the torus instability and the helical kink. Their thresholds represent quantitative onset criteria (in terms of the coronal magnetic field) which have received observational support. The good agreement between simulations of these instabilities and a number of solar events will be illustrated and current research projects in this area will be sketched.

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)