千葉大学大学院理学研究科附属

ハドロン宇宙国際研究センター

International Center for Hadron Astrophysics

8月 ICEHAP Seminar

2016年8月30日（火）午後3:00～

場所：工学系総合研究棟１、 ６階、609-1号室）

講師：加藤　成晃氏　（オスロ大学）

"New Insights into Chromospheric Structure and Dynamics ~ Oscillations and Vortices"

Abstract

The chromosphere is known as a complicated structured layer in the solar atmosphere. The thermodynamic state of the chromosphere is strongly affected by ionisation, radiative cooling by strong lines, and by radiative heating by the irradiation from the corona. These effects should be considered so that one can investigate how the chromosphere is heated and why it creates a peculiar structure. Oscillations and vortices have come to my attention over the past few years, because they are observational signatures of waves that may play a vital role in sustaining the chromosphere and the corona.

Based on two-dimensional radiation magnetohydrodynamic (RMHD) simulations including the aforementioned physics, we have found that a process called magnetic pumping excites recursively MHD shock waves, which propagate along magnetic flux concentrations. The heat flux resulting from these shocks is sufficient to sustain the chromosphere (Kato et al. 2016). The next step is elucidate the nature of chromospheric vortex flows, which are the observational signatures of magnetic tornadoes. By using automatic detection methods of a vortex flow on a model produced with three-dimensional RMHD simulations, we have found that a large number of vortices with smaller sizes and shorter life times than those found before. I will present results and discuss prospects for the future observations.

Location

Contact: 043-290-2763 [Division of Neutrino Astrophysics] 043-290-2885 [Division of Plasma Astrophysics]