

**N14b            Observation of Nonradial Pulsations in Zeta Ophiuchi with Gunma Astrophysical Observatory Echelle Spectrograph (GAOES)**

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Zeta Ophiuchi (O9.5Ve), which shows both multiple periodic oscillations and Be phenomenon, is a promising target for asteroseismology and to investigate a role of nonradial pulsations (nrp) on the episodic mass loss. We observed the line-profile variations (lpv) of  $\zeta$  Oph with Gunma Astrophysical Observatory Echelle Spectrograph (GAOES) from May 21 to June 14, 2005 (170 spectra in total), as a part of the three-week long campaign among ground-base observatories (Dominion Astrophysical Observatory 1.2m, Ondrejov Observatory 2m, and GAO 1.5m; high-resolution spectroscopy) and the Canadian MOST (Microvariability and Oscillations of STars) satellite (precise photometry). This was the first occasion of the extensive scientific use of the GAOES.

After careful data reduction and rectification of the stellar spectra, we can clearly see traveling bump features in the average subtracted (O-A) spectra in the H beta and HeI $\lambda$ 4922 lines, and detect the known two dominant periods (3.34 hr and 2.43 hr). Preliminary analysis of all the campaign data, from which we detect more periodicities than ever, shows that six periods are in common between the spectroscopy and the MOST photometry (Walker et al. 2005, AAS). We will discuss the nrp in  $\zeta$  Oph, emphasizing the importance of ground-base spectroscopic campaigns for mode identifications.