# Simulation of transient waves in the Martian atmosphere using general circulation models

**T. Kuroda** (1,2), A. S. Medvedev (1), P. Hartogh (1) and M. Takahashi (2)

(1) Max-Planck-Institute for Solar System Research, Katlenburg-Lindau, Germany, (2) Center for Climate System Research, University of Tokyo, Japan (kuroda@mps.mpg.de / Phone:+49-5556-979-468)

Observations of the atmospheric temperature on Mars by MGS-TES reveal the existence of transient waves in the northern hemisphere during autumns and winters. These waves with the zonal wavenumber 1 have periods of $\sim$20 Sols (Ls=240-260$^\circ$) and $\sim$6.5 Sols (Ls=280-300$^\circ$) [*Wilson et al*., 2002]. The former wave seems to be a manifestation of the Rossby wave associated with the inertially unstable region in low latitudes, while the latter, which is also seen in the analyses of Viking Lander data [*Barnes*, 1980, 1981], is apparently a baroclinic wave related to the strong meridional temperature gradient near the surface. We analyzed these waves using two newly developed Martian general circulation models (GCMs): MAOAM-GCM [*Hartogh et al*., 2005] and CCSR/NIES GCM [*Kuroda et al*., 2005]. Different scenarios for the dust opacity depending on the latitude and time to fit the observational data from MGS-TES and Viking spacecraft were utilized. In the presentation, the differences in the wave structure owing to the dust opacity variations and the comparison with the observations will be shown.