

# Solar-cycle variation of ion upflow in the polar ionosphere

# Akihiro Sakurai[1]; Ryouichi Fujii[2]; Yasunobu Ogawa[3]; Satonori Nozawa[2]

[1] Particle and Astrophysical Sci, Nagoya Univ; [2] STEL, Nagoya Univ; [3] STE Lab., Nagoya Univ.

We have investigated solar-cycle variations of ion upflow by using data obtained from the EISCAT UHF radar between 1987 and 1999. In this paper, as the first step, we focus on the variation of the altitudes where ions start to flow up from the polar ionosphere, particularly on how the variation changes in relation to solar activities.

An important phenomenon of the ionosphere-magnetosphere coupling is the ion upflow from the polar ionosphere into the magnetosphere. It is revealed by radar and satellite observations that the ionosphere provides a significant amount of source of the magnetospheric plasmas, on which the ion upflow is considered to play an important role.

In the polar ionosphere, upward ion flows along magnetic field lines have been observed with incoherent scatter (IS) radars and satellites. However, not fully understood has been how the ion upflow is driven in the ionosphere and how they are related to ion outflow and then the ion population in the magnetosphere.

One of the issues that are important to understand the driving mechanism of the ion upflow but we have little knowledge on at the moment is how the ion upflow is related to ionospheric conditions such as ion composition, density and temperature. Since the ionospheric conditions are strongly controlled by long-term solar activities represented by its solar cycle variations, as the first step, we have determined how the variation of the altitudes where ions start to flow up from the ionosphere changes in relation to the long-term solar activities.