Contribution ID: **221** Type: **Poster**

Penetrating waves along spicules to the corona

Alfvénic waves are one of the most promising candidates for heating the solar corona and accelerating the solar wind in polar coronal holes. These are observed as the transverse motion of spicules (jets elongated along the magnetic field lines) in the chromosphere. However, whether sufficient wave energy is carried to the corona remains unclear because the waves in the chromosphere suffer from the reflection in the transition region.
Here, we performed a statistical study of Alfvénic waves along spicules in polar coronal holes using spectroscopy of the *Interface Region Imaging Spectrograph (IRIS)*. We developed a technique for wave detection, wave-mode identification, and energy flux estimation for each detected wave using line-of-sight (LOS) velocity and intensity. 120 waves were detected, consisting of 62 ascending and 41 descending Alfvénic waves, 9 ascending and 8 descending slow-mode waves. If we assume that only the LOS component of random directional oscillations is observed, the averaged energy flux of ascending and descending Alfvénic waves can be estimated to be 2.2×10^5 erg cm^{-2} s^{-1} and 1.1×10^5 erg cm^{-2} s^{-1}, respectively.
Assuming that some fraction of ascending Alfvénic waves is reflected in the transition region and observed as descending Alfvénic waves, energy flux penetrating from the chromosphere to the corona is 1.1×10^5 erg cm^{-2} s^{-1}. This is the first estimation of energy flux penetrating to the corona and shows that it is enough for the coronal heating and the solar wind acceleration, even considering the wave reflection in the transition region.

Primary author: NAITO, YOSHIHIRO (NAOJ/SOKENDAI)

Co-authors: Dr OKAMOTO, Joten (NAOJ/SOKENDAI); Prof. HARA, Hirohisa (NAOJ/SOKENDAI)

Session Classification: Coffee break and poster session 1

Track Classification: Energy and mass transfer throughout the solar atmosphere and structures within