

A17c **High polarimetric sensitivity photospheric magnetic field observations with Solar Magnetic Activity Research Telescope (SMART)**

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It is widely accepted that the magnetic reconnection in the solar corona is responsible for the abrupt energy release in the solar flares. Thus, in order to understand the trigger mechanism of the flares, the precise coronal magnetic fields measurements are required. However, it is very difficult to precisely measure the coronal magnetic field, and the photospheric vector magnetic field measurement is used to estimate the coronal magnetic fields. Recent photospheric vector magnetic field observations with Hinode have revealed that tiny flux emergence events in active regions with the complicated magnetic field configuration trigger flares (Kusano et al. 2012). On the other hand, it is found that the magnetic shear associated with the inclination angle of the magnetic field line can be used to investigate the non-potentiality of active regions (Sanjay and Venkatakrisnan 2010). However, the detailed time evolution can not be well investigated with Hinode spectro-polarimeter, because typical time cadence of its observation is an hour or so. In order to obtain, high polarimetric sensitivity of 10^{-4} with time cadence of a few minutes, we have recently built a new filter vector magnetograph for the Solar Magnetic Activity Research Telescope (SMART) of Hida Observatory. In this poster paper, we present the instrument design the evolution of AR 11520 with paying attention to the small scale shear and flux emergence.