



Contribution ID: 460

Type: Poster

## Characterizing Spectral Channels of Visible Emission Line Coronagraph of Aditya-L1

Wednesday, 8 September 2021 17:35 (13 minutes)

Simultaneous spectroscopic and imaging observations can provide deep insight into diagnostic parameters of the solar corona and help us to understand the dynamics and origin of coronal mass ejections (CMEs). Visible emission line coronagraph (VELC), a payload on-board Aditya-L1, will provide spectroscopic observations of the inner corona from  $1.05 R_{\odot}$  to  $1.5 R_{\odot}$  in pass-bands corresponding to three ionization states of iron, FeXIV ( $5303 \text{ \AA}$ ), Fe XI ( $7892 \text{ \AA}$ ), and FeXIII ( $10747 \text{ \AA}$ ) and imaging in white-light continuum channel from  $1.05 R_{\odot}$  to  $3 R_{\odot}$ . To understand the instrument performance before its launch, we have used CHIANTI atomic database to generate synthetic spectra for the spectral channels in the temperature range of 1 MK to a few MK. We added the synthetic spectra with instrument scattered photon noise and detector noise and investigated the impact of plasma temperature on the signal-to-noise ratio (SNR). The SNR found to be highest at the formation temperature of the lines. We simulated synthetic spectra for a CME which was observed by KCor. The increment was seen in the peak electron counts for all three channels in the presence of CME. Doppler velocity was imposed on spectra of  $5303 \text{ \AA}$  at  $1.4 R_{\odot}$  for different SNR values and recovered after adding random noise to the spectra. The recovered Doppler velocity showed a notable departure from the imposed one for  $\text{SNR} \approx 1$  at line peak. In this poster, I will present the impact of different solar conditions on the performance of the spectral channels of VELC.

**Primary author:** PATEL, Ritesh (Aryabhata Research Institute of Observational Sciences, Indian Institute of Astrophysics)

**Co-authors:** A., Megha (Indian Institute of Astrophysics); SHRIVASTAV, Arpit Kumar (Indian Institute of Science, Aryabhata Research Institute for Observational Sciences, Indian Institute of Astrophysics); PANT, Vaibhav (Aryabhata Research Institute of Observational Sciences); VISHNU, M. (Indian Institute of Astrophysics); K., Sankarasubramanian (UR Rao Satellite Centre, Bangalore India); BANERJEE, Dipankar (Aryabhata Research Institute of Observational Sciences, Indian Institute of Astrophysics, CESSI)

**Presenter:** SHRIVASTAV, Arpit Kumar (Indian Institute of Science, Aryabhata Research Institute for Observational Sciences, Indian Institute of Astrophysics)

**Session Classification:** Poster Session 8.3

**Track Classification:** Session 3 - Fundamental Plasma Processes in the Solar Atmosphere: Magnetic Reconnection, Waves, Emission, Particle Acceleration