Visible Emission Line Space Solar Coronagraph on-board Aditya-1

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The visible emission line space solar coronagraph is a payload on-board Aditya-1 which will be the first Indian small-satellite space mission dedicated for solar studies. The main scientific objectives of this mission are: (a) Understanding of the wave heating mechanism of the corona using high frequency intensity oscillations, (b) Studies of the loop dynamics and its relation to the coronal dynamics, (c) Plane-of-the-sky magnetic field map of the loops and other coronal structures, and (d) Studies of coronal mass ejections (CMEs) close to the solar limb.

In order to fulfill the above scientific objectives, a 20cm visible emission line solar coronagraph will be developed. The field-of-view (FOV) covered by the coronagraph will be from 1.05Rsun to 3.0Rsun and the time cadence can be as high as two images per second. Simultaneous measurement of the green (530.3nm) and red (637.4nm) emission lines will be used to observe the loop dynamics and the intensity oscillations. The combined polarization studies of the green line with that of the near-by continuum (~580nm) will provide the plane-of-the-sky magnetic field map. The FOV of this payload will provide CME data closer to the disk and hence complimentary to other CME instruments in space. Due to observations starting closer to the disk, the data from this payload is expected to provide opportunities to study the initial phase of the CMEs and its evolution.