

Solar Soft x-ray Spectrometer (S³) on-board Venus Orbiter Mission

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Solar Soft X-ray Spectrometer (S³) is one of the payloads onboard the orbiter of the upcoming Venus mission. The primary objective of the instrument is to measure the solar flux around Venus in the soft X-ray region (energy range of 1 - 15 KeV) in order to understand the enhancement in the electron density in the Venus atmosphere at around 127 km (Patzold et al., 2007). S³ will give accurate information about the arrival of X-ray flares and using this measurement one can study its effects on the Venus atmosphere. The instrument will also study the variation in solar flux with time, which can be correlated with the measurements from other instruments such as Magnetometer, Mass spectrometer and Radio occultation experiments.

The instrument uses state of the art Silicon Drift Detector (SDD) to cover the X-ray energy range of 1-15 keV and provides a spectral resolution of better than 180 eV at 5.9 keV. S³ incorporates a special moving mechanism to accommodate Be filter and calibration source in order to cover the very wide range of intensities of X-rays during large solar flares and on-board calibration. The instrument will provide high cadence X-ray spectral measurements during wide range of Solar flare classes, which will be useful in modelling the solar coronal emission. The instrument will be very much similar to the Solar X-ray Monitor on-board the orbiter of the Chandrayaan 2 mission, with changes to suit the Venusian atmosphere. Here, we present the various design aspects of the instrument and the realisation plan.