The Hindu, Tuesday, September, 8, 2009, pp. 4

Aditya-1 may help satellites dodge solar radiation

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BANGALORE: If the premature end of Chandrayaan-1 was triggered, in part, by solar radiation, Aditya-1, India's sun mission, may offer clues future space missions can use to keep themselves safe from the dynamic star's energy.

An advanced solar coronagraph on board Aditya-1 will study the fiery solar corona, the sun's outermost region, where temperatures rise to more than a million degrees and solar flares erupt, releasing so much energy as to endanger satellites and even disrupt power transmission on earth, said Jagdev Singh, senior professor of the Indian Institute of Astrophysics (IIA) and principal investigator for the mission.

The satellite, weighing around 100 kg, will be launched in 2012 to coincide with the 'solar maximum,' or a phase of high solar dynamism. "With the increase in the number of satellites as well as manned operations in space, it is necessary to understand space weather conditions," says the 88-page proposal report prepared by members of the working group. It will be submitted to the Space Commission this month.

The sun and its dynamic corona as captured by a coronagraph on board the Solar and Heliospheric Observatory.

With the "increasing dependence on technologies that are vulnerable to space weather transients, it has become crucially important to understand various components in the overall sun-earth transmission line," says the report. Aditya-1 will complement ground-based telescopes and other space missions, forming a suite of instruments to study the effects of solar flares and coronal mass ejection on the near-earth environment and "improve the predictability of space weather events."

The satellite's visible wavelength space-bound coronagraph will also "fill crucial gaps" in the understanding of the solar corona, the processes that heat it, produce coronal mass ejections and accelerate solar wind. "Unlike Aditya, most space-based instruments observe the corona at UV wavelengths and capture images at a relatively low temporal resolution. Also, there are no such missions planned between 2012 and 2016 [coinciding with a solar maximum], during which period Aditya will provide important data," Professor Singh said.