Stereo X-Ray Corona Imager: Report on New Mission Concept Study

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The Stereo X-Ray Corona Imager (SXCI) mission for stereo observat ions of the structure and dynamics of the solar corona is currently under study as part of NASAS New Mission Concepts program. Here we summarize results from two study areas: stereo data analysis and spacecraft trade studies. In the SXCI mission concept, the SXCI spacecraft with a soft X-ray telescope would be launched into an in-ecliptic orbit at 1 AU leading or trailing Earth by 10-45. The soft X-ray telescope on the spacecraft would be identical to a soft X-ray telescope that will already be in geosynchronous orbit on-board a NOAA GOES-series weather satellite and the two instruments will be used together to form a stereo pair. Three dimensional images and videos of the corona will be obtained by combining the data from the two X-ray telescopes. X-ray emission from the solar corona gives information about complex magnetic morphology of the corona. The SXCI mission has the potent ial to answer one fundamental problem in solar physics: What are the changes in magnetic structure that precede and follow explosive coronal events such as coronal mass ejections (CMES), eruptive flares and prominence eruptions? To address this question, data analysis techniques are being developed to extract quantitative information on the changes in the magnetic field from stereo observations. Progress on tools to trace observed coronal features in three dimensions will be reported. Results on trade studies on data handling strategies and telemetry will also be discussed.

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