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Title:	Pre-flight evaluation of the soft X-ray telescope optics aboard AstroSat.
Authors:	Singh, Kulinder Pal (/jspui/browse?type=author&value=Singh%2C+Kulinder+Pal)
Keywords:	X-ray telescopic astro satellite
Issue Date:	2021
Publisher:	Springer Nature
Citation:	Journal of Astrophysics and Astronomy, 42(2).
Abstract:	Soft X-ray telescope (SXT) built on the principle of grazing incidence optics was launched on-board AstroSat on September 28, 2015, and made operational on October 26, 2015. The telescope optics consists of two conical sections of approximate paraboloid and hyperboloid mirror segments arranged in Wolter type-I design. It comprises a total of 320 mirror segments made from aluminum foil of 0.2 mm thickness coated with gold on the front (reflective) side by the replication process that was first used in the Suzaku Observatory. The mirrors focus X-rays in the energy range of 0.3–8.0 keV on to a charged coupled device-based focal plane camera assembly at a distance of 2 m. We present here the pre-launch, ground-based calibration, and evaluation of SXT optics carried out at the X-ray Optics Laboratory at the Tata Institute of Fundamental Research. The SXT optics assembly was calibrated and evaluated experimentally, using scans by a collimated optical beam from a laser source, as well as using a full-aperture optical beam from an inverse telescope. A collimated beam of a red laser source was used to ensure the accuracy of mounting of individual mirror segments and the full aperture beam white light-emitting diode (LED) source was used to estimate the point spread function (PSF) of all 320 mirrors together. The approximate PSF obtained during the ground calibration was around 136.6 arcsec. These results were in accordance with the results obtained during the in-orbit calibration post launch.
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.1007/s12036-021-09754-y (https://doi.org/10.1007/s12036-021-09754-y) http://hdl.handle.net/123456789/5207 (http://hdl.handle.net/123456789/5207)
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