

Solar neutron observations with ChubuSat-2 satellite

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Solar neutron observation is a key in understanding of ion acceleration mechanism in the Sun surface since neutrons are hardly affected by magnetic field around the Sun and interstellar mediums unlike charged particles. However, there was only a few tenth detections so far since its discovery in 1982. Actually SEDA-AP Fiber detector (FIB) onboard the International Space Station (ISS) was suffered from a high neutron background produced by the ISS itself.

ChubuSat is a series of 50-kg class microsatellite jointly developed by universities (Nagoya university and Daido university) and aerospace companies at the Chubu area of central Japan. The ChubuSat-2 is the second ChubuSat following the ChubuSat-1 which was launched by Russian DNEPR rocket on November 6, 2014. It was selected as one of four piggyback payloads of the X-ray astronomy satellite ASTRO-H in 2014 summer, and will be launched by the H-IIA launch vehicles from JAXA Tanegashima Space Center (TNSC) in February 2016. The ChubuSat-2 carries a mission instrument,

radiation detector (RD). The main mission of ChubuSat-2 is devoted for monitoring neutrons and gamma-rays which can be background source for ASTRO-H celestial observations with the RD. The mission also involves a function of solar neutron observations which were originally proposed by graduate students who join the leadership development program for space exploration and research, program for leading graduate schools at Nagoya University. The RD has a similar detection area and efficiency to those of the SEDA-AP FIB, but is expected to have lower background than the ISS thanks to much smaller mass of the micro-satellite. In this paper, we will describe details of ChubuSat-2 satellite and RD, and in-orbit performance of RD.

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