

SPACE CUBE 2 - AN ONBOARD COMPUTER BASED ON SPACE CUBE ARCHITECTURE

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Short Paper

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ABSTRACT

Space Cube 2 is an onboard computer designed for future small satellites. It has been developed with reference to Space Cube, which is the commercial version of minimum set of OBC. Space Cube has an architecture based on the extraction of minimum set of T-Engine and SpaceWire standard. Space Cube 2 uses the architecture implemented in Space Cube and specially designed for the use in space. JAXA's new 64 bit one-chip micro controller with peripheral devices, as well as high density static RAM (random access memory) are used to obtain high performance required to handle observational data from sensors. T-Engine used in the Space Cube and Space Cube 2 is a platform for embedded computers and enables us to design OBC with fast software response. Latest version of TRON real-time operating system, which is called as "T-Kernel" is provided for T-Engine as an open source, and its high speed latency is important for flexible science mission control. Space Cube 2 is small enough for high agility small satellites, especially for scientific

purpose. Combination of Space Cube on the ground and Space Cube 2 in space provides us friendly platform for developments of satellites, since one could develop onboard software and flight equipments with low-cost commercial Space Cube and easily integrate them in the Space-Cube2 based satellites . Here we present the Space Cube architecture and the status of the first demonstration of Space Cube2 in space, which will take place in 2008 by using JAXA's technology demonstration satellite, SDS-1.