

# STANDARD ONBOARD DATA HANDLING ARCHITECTURE BASED ON SPACEWIRE

**Session: SpaceWire missions and applications**

## **Short Paper**

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### **ABSTRACT**

This paper presents the standard onboard data handling architecture that JAXA is developing presently. This architecture specifies an architectural framework on how to develop onboard data handling systems and will be used for all the science spacecraft that JAXA will develop. This architecture consists of three sub-architectures: physical architecture, functional architecture and protocol architecture.

The physical architecture specifies how to configure onboard data handling systems physically and defines basic physical elements. Any onboard data handling system will be constructed physically by connecting basic physical elements according to the characteristics and the complexity of the spacecraft. The functional architecture specifies how to configure onboard data handling systems functionally and defines basic functional elements. These functional elements are implemented in physical elements. The protocol architecture specifies how to connect physical and functional elements with communications protocols and defines a set of protocols to be used. The most basic protocol in the protocol architecture is the SpaceWire protocol and it is accompanied by SpaceWire RT and Remote Memory Access Protocol (RMAP).

JAXA is also developing standard components based on this architecture, which include standard physical components and standard functional components. By using this architecture, the basic portion of onboard data handling systems will be developed by selecting appropriate standard components and connecting them with standard protocols. This will facilitate the design, integration and testing of onboard data handling systems greatly.