Advanced Hybrid On-Board Data Processor – SpaceCube 2.0

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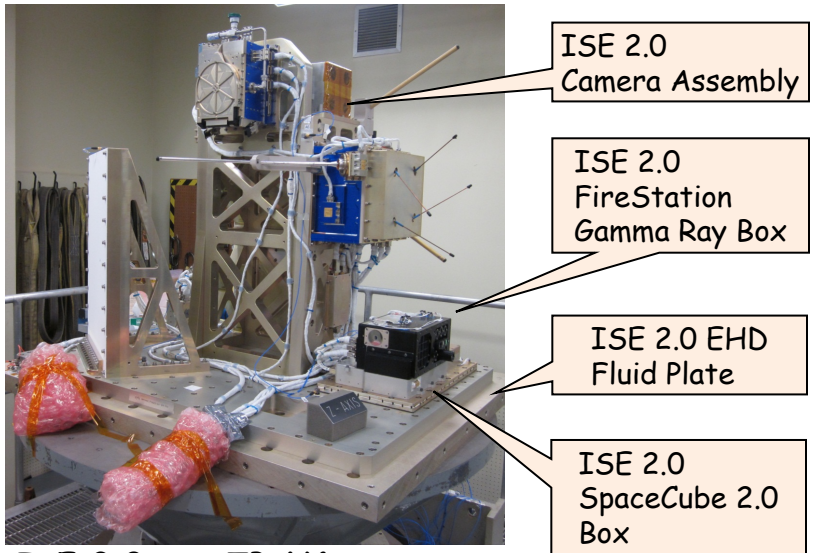
Objective

Develop advanced on-board processing to meet needs of future Earth Science missions (e.g., ACE, DESDynI, GEOCAPE, HyspIRI) advanced instruments such as hyper-spectral and synthetic aperture radar to facilitate:

- timely conversion of Earth Science data into information - reconfiguration or adaptation on-the-fly
- detection and reaction to events
- production of data products on-board for direct downlink, quick look, and first responder real-time awareness - sensor web multi-platform collaboration
- on- board lossless data reduction by moving ground functions on-board

• Provide users with the choice between "perfect data using a RAD750" or "100x more data plus next generation capabilities, with (maybe) an occasional bad pixel, using SpaceCube 2.0"



ISE 2.0 on STP-H4

Accomplishments

- Successfully designed, fabricated and tested SpaceCube 2.0 Engineering Model (EM) that leveraged SpaceCube 1.0 (which demonstrated 99.9979% "up-time" on the ISS since 11/09)
- Leveraged collaboration with the Department of Defense (DoD) to fly SpaceCube 2.0 Engineering Model (EM) on ISS as part of Space Test Program (STP) H4 mission (STP-H4)
- Demonstrated 30X computing improvement, 79X algorithm acceleration, 165X data volume reduction
- Successfully developed ISE 2.0 experiment platform and experiment flight software, executed functional and environmental testing, and integrated experiment with the STP-H4 experiment pallet
- Completed STP-H4 system level functional and environmental testing for shipment to launch site

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$TRL_{in} = 4$ $TRL_{out} = 6$