## Flight SW and SVF (Software Verification Framework) for Microsatellites

SPACE QUALIFIED ON-BOARD SOFTWARE
- Engineering support during project phases A, B, C/D & E
- StartUp SW – Mission critical SW (stored in PROM)
- Application SW (stored in FLASH memory/EEPROM)

SPACE QUALIFIED ON-BOARD SOFTWARE FEATURES
- Control of the instrument and interface to the spacecraft
- SpaceWire link interface, using the 'CCSDS packet transfer protocol'
  and ESA Packet Utilization Standard (PUS) TC/TM interface
- Housekeeping data acquisition and reporting
- FDIR (Failure detection, isolation and recovery) with a high level of autonomy
- Science data acquisition and storage in the instrument internal mass memory
- On-board data processing:
  - Autonomous based on user parametrisation
  - Selective based on user TC requests – possible to select data from the instrument internal archive in the mass memory
- SW developed in C language, or time critical routines in Assembly
- HW target: Leon 3FT IP core in FPGA, or Space Qualified microcontrollers
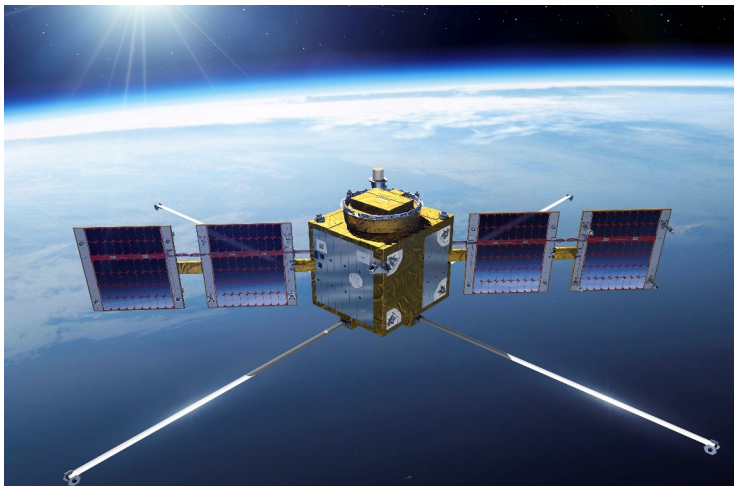
EXAMPLES
- Solar Orbiter's STIX instrument
- SWARM's Accelerometer
- Hard X-Ray Spectrometer
- Demise Observation Capsule DOC
- Multi-mission satellite platform
- MetOp-SG instrument bootloaders

SVF

The aim of using SVF is to validate the entire software of the microsatellite control SW or its instrument.

SVF (SOFTWARE VERIFICATION FRAMEWORK) FEATURES

- Testbench HW (T-HW) test environment hardware used to verify the SC-SW when operating in the target environment
- HW (T-HW) test environment hardware used to verify the SC-SW when operating in the target environment
- Enables connection of needle tester device to inject error signals into the PCB
- SVF is (based on AI) for automatic processing of test cases into activity diagrams

PRICE

- Available upon proposal.

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