



### Description & Motivation:

- In Orbit Demonstration of a satellite payload for feeder link and Earth observation applications using E/W-Band Radio Frequency (RF) Analog Frontend and ultra high speed FPGA-based digital IF and Baseband processing
- The onboard signal processing will be based on an FPGA-platform, therefore allowing for a dynamic data throughput customization as well as live characterization of the modulated communication signal, combined with an MMIC-based RF transmit frontend and 2W GaN-based SSPA output stage and 2 dB NF GaAs LNA receiver.

### Tasks:

- Generate bit sequences on the FPGA with different data rates (up to 20 Gbps), modulation formats, power levels.
- Transfer the bit sequences to an analog-to-digital (D/A) converter and transmit the data through a noisy channel.
- Receive the data and digitize it with an analog-to-digital converter (A/D) and dynamically compare it with the transmit data
- Improve the signal quality transmission in the digital domain to overcome impairments from the noisy channel.
- On-board Live signal processing, characterization and degradation compensation.



[EIVE Digital Baseband (flight HW), in the function of Arbitrary Waveform Generator (AWG) based on multiMIND Platform]

