sion control of more powerful but much less frequency-agile quantum mechanical terahertz sources.

# Onboard Interferometric SAR Processor for the Ka-band Radar Interferometer (KaRIn)

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An interferometric synthetic aperture radar (SAR) onboard processor concept and algorithm has been developed for the Ka-band radar interferometer (KaRIn) instrument on the Surface and Ocean Topography (SWOT) mission. This is a mission-critical subsystem that will perform interferometric SAR processing and multi-look averaging over the oceans to decrease the data rate by three orders of magnitude, and therefore enable the downlink of the radar data to the ground.

The onboard processor performs demodulation, range compression, co-registration, and re-sampling, and forms nine azimuth squinted beams. For each of them, an interferogram is generated, including common-band spectral filtering to improve correlation, followed by averaging to the final 1×1-km ground resolution pixel. The onboard processor has been prototyped on a custom FPGA-based cPCI board, which will be part of the radar's digital subsystem.

The level of complexity of this technology, dictated by the implementation of interferometric SAR processing at high resolution, the extremely tight level of accuracy required, and its implementation on FPGAs are unprecedented at the time of this reporting for an onboard processor for flight applications.