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Keeping up with a fast changing world with rapid-revisit and long-dwelling SAR observations

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The Earth is facing increasingly frequent natural disasters and environmental changes that require continually advancing techniques to observe, measure, understand and respond to. For decades, Synthetic Aperture Radar (SAR) data has provided a critical input for scientists, engineers and analysts seeking to gain a better understanding of the processes that occur before, during and after an event. Although some processes are slowly evolving, taking months or even years to accumulate significant change, it is the critical moments just prior to an event and onward that often require data more frequently than it is available. Similarly, some earth processes simply develop too quickly to be captured with a revisit rate of several days or weeks.

A new paradigm is emerging in earth observation, enabled by the proliferation of SAR sensors in orbit that can be combined to provide daily and even sub-daily coherent revisit rates. Along with these new satellite missions come advances in sensor technology providing enhanced modes of SAR imaging. Among these is long-dwell imaging that provides considerably richer information and perhaps most interestingly, the ability to produce SAR videos, capturing changes as they occur.

This talk will present highlights from our experience utilizing the ICEYE SAR constellation in real earth science and natural catastrophe scenarios where rapid revisit or long-dwell were key enabling factors. By showing a glimpse into these dynamic processes as they unfold, we hope to inspire a new way of thinking about SAR data and challenge the conventional wisdom about what problems can and cannot be solved using SAR. It's clear that we are only scratching the surface and that there remain many new things we can learn.