Introduction: What is Radar Interferometry, Anyway?

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To introduce the session on Geophysical Applications of Radar Interferometry, it is appropriate to describe the technique, its history, and future implementations. The technique makes usc of two phase-coherent radar images, obtained with a very small baseline separation (meters to a km or so), which are combined so as to produce interference fringes. Knowledge of the baseline separation and attitude is enough to produce a topographic map. The images may be obtained by the same radar passing twice over the target ("repeat-pass"), by two separate antennas on a single platform, or by two independent radars operating in tandem. A variation, called differential interferometry, makes usc of existing digital topographic data to remove the fringes caused by the topography, yielding cm-level sensitivity to topographic changes between images obtained before anti after the change. This technique has been used to map the co-seismic displacement field of several recent earthquakes.

Radar interferometry was first demonstrated in the mid-80's with Seasat images obtained in 1978. After INS-1 was launched, significant new data became available and the addition of ERS-2 has been used to improve the flow of interferometric data. The Japanese JERS- 1 has aiso produced important interferometric data sets. last year, the two flights of the Shut(lc-borne SIR-C/X-SAR provided new data al a variety of wavelengths and polarizations. During this time period, a number of airborne platforms have been used to collect interferometric data as WC]]. Potential future missions include another flight of SIR-C/X -S AR, modified to produce a global digital elevation data set and free-f]ying satellites for monitoring small topographic changes.

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