

Results from the JPL TOPSAR L-band and C-band Interferometric
Topographic Mapping System

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The JPL TOPSAR mapping system was extended from a C-band (5.6 cm wavelength) dual-aperture SAR interferometer to include an analogous L-band (24 cm wavelength) system, allowing simultaneous dual-frequency topographic mapping. Calibration of the L-band system was aided by the well-known C-band system characteristics, by taking advantage of the identical processing scenarios and geometries afforded by simultaneous acquisition. Topographic maps at two frequencies generated for the Elkhorn Slough and Laurel Quad areas of California afford detailed comparison of a variety of terrains, from flat fields to forested mountains. Data were also acquired with multiple baselines by transmitting alternate radar pulses from alternate antennas. The interferometric correlation and topographic height characteristics of the sites are compared among frequencies and baselines, related to the surface parameters and canopy depths. Average correlations exceed 94% for C-band and 97% for L-band, the difference being attributable to superior signal-to-noise properties at L-band. Understanding of frequency and baseline diverse penetration effects is underway and results will be presented.