

GeoSAR: A NEW RADAR TERRAIN MAPPING SYSTEM FOR THE NEW MILLENNIUM

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GeoSAR (Geographic Synthetic Aperture Radar) Project is a new 3 year effort to build a unique, dual-frequency, airborne Interferometric SAR for mapping of terrain. This Project, which is funded by the Defense Research Projects Agency (DARPA), will be conducted via a Consortium of the Jet Propulsion Laboratory, Calgis, Inc., and the California Department of Conservation. The airborne portion of [his system will operate on a Gulfstream-II aircraft outfitted with P- and X-band Interferometric SARs. The ground portions of this system will be an IFSAR Processor and a Radar-GIS Workstation.

The airborne P-band and X-band radars will be constructed by JPL with the goal of obtaining foliage penetration at the longer P-band wavelengths. The P-band and X-band radar will operate at frequencies of 350 Mhz and 9.71 Ghz with bandwidths of either 80 or 160 Mhz. The airborne radars will be complemented with airborne laser system for measuring antenna positions as well as an aerial camera.

The ground processing will be a two-step step process. First, the raw radar data will be processed into radar images and interferometer derived Digital Elevation Models (DEMs). Second, these radar images and DEMs will be processed with a Radar GIS Workstation which performs processes such as Projection Transformations, Registration, Geometric Adjustment, Mosaicking, Merging, Classification via Interferometric Correlation and Database Management. JPL will construct the IFSAR Processor and Calgis, inc. will construct the Radar GIS Workstation.

The GeoSAR Project was underway in November 1996 with a goal of having the radars and laser systems fully integrated onto the Gulfstream-II aircraft in November 1998. Then, both Engineering Checkout and User Validation Flights will be conducted from November 1998 through November 1999. The California Department of Conservation will conceive and lead the User Validation Flights, The overall system will be delivered at the end of 1999 and ready for routine operations in the year 2000.