EARTH IMAGING RESULTS FROM GALILEO'S SECOND ENCOUNTER:

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The recent flyby of the Galileo spacecraft en route to Jupiter contributes a unique perspective to our view of our home planet. Imaging activities conducted during the second Earth encounter provide an important opportunity to assess new methods and approaches on familiar territory. These include unique multispectral observations, low light-level imaging (searches for aurorae, lightning and artificial lights on the nightside) and experiments with multiple exposure times to extend the effective radiometric resolution and dynamic range of the camera system.

Galileo imaging data has the potential to make important contributions to terrestrial remote sensing. This is because the particular set of filters included in the Solid State Imaging system are not presently incorporated in any currently operating Earth-orbiting sensor system. The visible/near-infrared bandpasses of the SSI filters are well suited to remote sensing of geological, glaciological, botanical and meteorological phenomena. Data from this and the previous Earth encounter may provide an extremely valuable reference point in time for comparison with similar data expected from EOS or other systems in the future, contributing directly to our knowledge of global change.

The highest resolution imaging (0.2 km/pixel) during the December, 1992 encounter occurred over the central Andes; a five filter mosaic of visible and near infrared bands displays the remarkable spectral heterogeneity of this geologically diverse region. As Galileo departed the Earth, cooperative imaging with the Near Infrared Mapping Spectrometer (NIMS) instrument targeted Antarctica, Australia and Indonesia at 1.0 to 2.5 km/pixel resolutions in the early morning local times near the terminator. The Antarctic data are of particular interest, potentially allowing ice grain size mapping using the 889 and 968 nm filters and providing an important means of calibrating the technique for application to the Galilean satellites. As the spacecraft receded further, regional scale imaging provided data which, along with data from the previous encounter, will enable the production of global multispectral mosaics of Earth in each of the SSI filters.