IMPROVED ACCESS TO MARTIAN INFRARED RADIOMETRY/SPECTROSCOPY DATASETS;
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The Pilot Planetary Data System (PPDS) Project is developing and demonstrating tools for improved access by the research community to planetary datasets. Such tools include database management systems, communication packages, storage media, languages for data manipulation, and modular documentation. One demonstration goal is the refurbishment and documentation of infrared radiometry/spectroscopy datasets from Mariner 6,7,9, and Viking. Refurbishment involves locating, reading, reformatting the data if necessary, collecting descriptive materials, and implementing basic access software. Documentation consists of building on-line help files which address such topics as project/experiment/instrument design, calibration, data usage, and references. The Viking Infrared Thermal Mapper (IRTM), Mars Water Vapor Detector (MAWD) and the Mariner 9 Infrared Radiometer (IRR) data were recently incorporated into a transportable database/analysis system by R. Mehlman; a modification of that system to require less user expertise is underway. A search-select-display software system for the Mariner 9 Infrared Interferometer-Spectrometer (IRIS) data has been completed. The Mariner 6 & 7 IRR dataset has been recovered. A future phase of the demonstration will include having the datasets on-line and accessible to remote users. The IRIS access system now allows local or remote access and interactive or batch job submission; this is planned for all the data sets.

A dataset of particular interest that has been restored to machine-readable format is that from the Mariner 6 & 7 Infrared Spectrometer (IRS), for which only microfiche data have been available from the NSSDC. Of the IRS 1.9-14.4 micron coverage, that shortward of 5.0 microns is unique among Mars spacecraft experiments, and the data are relevant to the near-IR remote sensing objectives of the MGCO mission. Software to access, print, and plot IRS data have been written. The encounter geometry has been digitized and merged with the data, enabling geometric searches and correlations with existing Mars databases.

We have analyzed IRS spectra in the 2.0-2.7 micron range to assess the origin of absorption features with 1-2% depth. Among these are two bands due to CO_2 and a broad feature at 2.34 microns apparently characteristic of surface material. Singer et al (1) have attributed this feature in their Earth-based spectra to clays. The greater signal:noise and higher spatial resolution of the IRS data should permit better interpretation of this spectral feature, which had gone unnoticed in the 15 years since the data were acquired.

1. Singer R. B., Owensby P.D. and Clark R.N. (1984) Bulletin of the AAS 16, p. 679.