CONTROL ID: 2566831

TITLE: The Venus Emissivity Mapper

ABSTRACT BODY:

Abstract (2,250 Maximum Characters): The permanent cloud cover of Venus prohibits observations of the surface with traditional imaging techniques over the entire visible spectral range. Fortunately, Venus' atmospheric gases are largely transparent in narrow spectral windows near 1 mm. Ground observers were the first to successfully use these windows, followed by spacecraft observations during the flyby of the Galileo mission on its way to Jupiter and most recently from Venus orbit by ESA's Venus Express with the VMC and VIRTIS instruments. Analyses of VIRTIS measurements have successfully demonstrated that surface information can be extracted from these windows, but the design of the instrument limited its use for more in-depth surface investigations.
Based on experience gained from using VIRTIS to observe the surface of Venus and new high temperature laboratory experiments currently performed at the Planetary Spectroscopy Laboratory of DLR, we have designed the multi-spectral Venus Emissivity Mapper (VEM).
Observations from VIRTIS have revealed surface emissivity variations correlated with geological features, but existing data sets contain only three spectral channels. VEM is optimized to map the surface composition and texture, and to search for active volcanism using the narrow atmospheric windows, building on lessons from prior instrumentation and methodology. It offers an opportunity to gain important information about surface mineralogy and texture by virtue of having six different channels for surface mapping.
VEM is focused mainly on observing the surface, mapping in all near-IR atmospheric windows using filters with spectral characteristics optimized for the wavelengths and widths of those windows. It also observes bands necessary for correcting atmospheric effects; these bands also provide valuable scientific data on composition as well as altitude and size distribution of the cloud particles, and on H_2O vapor abundance variations in the lowest 15 km of the atmosphere.
In combination with a high-resolution radar mapper that provides accurate topographic data as planned for the NASA VERITAS mission or for the ESA EnVision mission, VEM will provide new insights into current properties and the geologic evolution of Venus

CURRENT * CATEGORY: Venus

CURRENT : None

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