Geophysical Research Abstracts,
Vol. 10, EGU2008-A-07631, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-07631
EGU General Assembly 2008

Analysis of fluvial features at Xanadu-Regio, Titan, observed by Cassini-RADAR and Cassini-VIMS

M. Langhans (1), R. Jaumann (1,2), K. Stephan (1), R. H. Brown (3), B. J. Buratti (4), R. Clark (5), K. H. Baines (4), P. D. Nicholson (6), R. D. Lorenz (7)

(1) DLR, Institute of Planetary Research, Berlin, Germany, (2) Dept. of Earth Sciences, Inst. of Geosciences, Freie Universität Berlin, Germany, (3) Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ, 85721 USA, (4) Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California 91109, USA, (5) U.S. Geological Survey, Denver, CO, 80225 USA, (6) Cornell University, Astronomy Department, Ithaca, NY, USA, (7) Space Department, Johns Hopkins University Applied Physics Lab, Maryland 20723-6099, USA

(mirjam.langhans@dlr.de)

Fluvial erosion caused by liquid hydrocarbons is likely on Titan, Saturn's largest moon. One of the main objectives of studies coping with Titans surface is to detect traces of surficial liquid. The present investigation focuses on analyzing fluvial features within the Xanadu-Region, an expanded near-infrared-bright continent on Titan, centered at 10˚S and 100˚W, as identified in highly resolved Cassini-RADAR-images. Subsequent, a comprehensive spectral analysis was performed using Cassini-VIMS-data that overlap the radar-swath and allow the studying of Titan's surface properties in the NIR-atmospheric windows at 0.94μm, 1.08μm, 1.30μm, 1,60μm, 2.03μm, 2.71μm, 2.81μm and 4.90μm.

Xanadu's channels constitute a complex network; some of them comprise lengths of several hundreds kilometers. Morphological characteristics of that channel-network such as distinct meandering and the dendritic arrangement of channels point to similar drainage patterns on Titan and Earth. These similarities suggest that Xanadu's channel network developed as a consequence of precipitation and subsequent surface runoff of a liquid medium. Nevertheless, the formation of this network seems to be unrelated

to the particular surface roughness of the substrate signified through the brightness values of the RADAR-data.

Despite of its coarse ground resolution with a maximum value of 3.73km/pixel channels are also discernible in the VIMS-data. In general, fluvial deposits in the riverbed appear darker compared to the near-infrared-bright material of Xanadu. These spectral differences are expected to be a consequence either of enhanced water-ice content or enrichment in other organics, as discussed in [1].

References:

[1] Barnes, J. W. et al. (2007): Near-infrared spectral mapping of Titan's mountains and channels, *J. Geophys. Res.*, 112, E11006, doi:10.1029/2007JE002932.