RIVERS ANALYSIS FROM A REFINED TOPOGRAPHIC MAP ON SATURN'S LARGEST MOON, TITAN. C. Daudon[1], J.T. Perron[2], J.M. Soderblom[2], S. Rodriguez[1], A. Lucas[1], S. Jacquemoud[1]. [1]Université de Paris, Institut de physique du globe de Paris, CNRS, Paris, France (daudon@ipgp.fr), [2]Department of Earth, Atmospheric and Planetary Science, Massachusetts Institute of Technology, Cambridge, USA.

After 13 years of observations by the Cassini-Huygens probe, Titan, Saturn's largest moon, has been found to be unique in the Solar System. Singularly similar to the Earth, its surface displays morphologies familiar to us: drainage basins and river systems, lakes and seas, dune fields, and incised mountains.

Titan's methane cycle plays a major role in its climate and geology, driving a wide range of processes that shape the landscape, such as fluvial erosion. Similar to erosion by water on Earth, liquid methane carves into Titan's surface, forming river valleys. These river networks are particularly discernible in images acquired near the equator by the Huygens probe. To improve understanding of the processes at work, one needs a detailed and accurate digital terrain model (DTM) of this region.

Previous studies investigated the river networks near the Huygens landing site but they based their analysis on a DTM that has some limitations that could significantly bias the interpretation of the morphology and the geology of the area. Taking advantage of significant improvements in the quality of Huygens navigation information and of the DISR images, we built a new DTM of the landing site offering a higher spatial sampling and a more reliable topography.

Since we focus our study on the river networks, we hydrologically conditioned our DTM, as is commonly done for terrestrial studies (i.e., HydroSHEDS, MERIT Hydro). Then we used this DTM, which offers the best available resolution of hillslopes and river valleys on Titan, to perform an accurate morphometrical analysis of the terrain.

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