



## **Louth crater: Water vapour distribution as seen by CRISM/MRO**

**R. Melchiorri** (1); T.L. Roush (1); R.M. Haberle (1); A. J. Brown (2) ; T. Encrenaz (3); CRISM team

- 1) NASA AMES Research Center, Moffet Field, CA, 94035, USA
- 2) SETI Institute, 515N. Whisman Rd, Mountain View, CA 94043, USA
- 3) LESIA Observatoire de Meudon 5, place Jules Janssen, 92195 Meudon, France

“Louth” crater (70.5°N, 103.2°E, name submitted to IAU for consideration) has been identified to have a greater resemblance to the polar cap than previously expected [1 and 2]. This crater is a conveniently small and contains a central water ice deposit that is suitable for testing models of volatile stability in the Martian north polar region.

A sensitive detector for water stability is the study of water vapour distribution, which could reveal the presence of interactions between the surface and atmosphere by identifying possible sources and sinks.

By adapting the water vapour analysis already developed and tested for the OMEGA/Mars Express data [3 and 4] we have been able to retrieve the total amount of water vapour from the CRISM/MRO data. This retrieval was performed on two independent high spectral-spatial resolution observations of Louth crater.

For the first time a water vapour distribution at the 1/1000 of a degree scale is presented. Opening the possibility of studying atmospheric water dynamics at very high spatial resolution, like on the boundary of the ice mound, and thus providing hints regarding the presence and extent of the ice under the close dusty regions.

We present the method and some preliminary results of the analysis, showing in detail the distribution of water vapour on and near the ice mound and near the northern crater rim.

**References:**

- [1] A.J. Brown et al; ICARUS (in press) 2008
- [2] A.J. Brown et al; LPCI 2008
- [3] R. Melchiorri et al ; Plan and Space Sci. 55 (2007) 333–342
- [4] T. Encrenaz et al A&A 441, L9–L12 (2005)