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Mars CO_2 ice clouds: results of 5 Martian years of monitoring by OMEGA/Mars Express

B. Gondet (1), J-P. Bibring (1) and M. Vincendon (1)

(1) Institut d'Astrophysique Spatiale Bâtiment 121 Université Paris-Sud 91405 Orsay Cedex France (brigitte.gondet@ias.u-psud.fr Fax: +33169858675)

1. Introduction

An important achievement of the ESA/MarsExpress mission is the detection of mesospheric CO_2 ice clouds, by indirect (PFS [1] and SPICAM [2]) and direct (OMEGA [3,4] and HRSC [5]) observations, as suggested by Clancy et al. [6]. These clouds have been recently detected by CRISM [7] and MCS [8] on board MRO.

2. Observations

Back in 2007, OMEGA provided the first non ambiguous discovery and characterization of high altitude CO_2 clouds in Mars atmosphere, at specific locations and times, through their diagnostic reflectance signature at 4,26 µm and/or at .4 µm (fig 1) They were monitored, in their space/time evolution, during 5 consecutive Martian years. They offer a unique possibility to understand the processes involved in cloud formation, both on Mars and Earth. We will present an overview of the properties of these clouds in terms of location, altitude, seasonal variation, and opacity. Although no definite explanation for their formation can be proposed, we will suggest potential processes and conditions to account for.

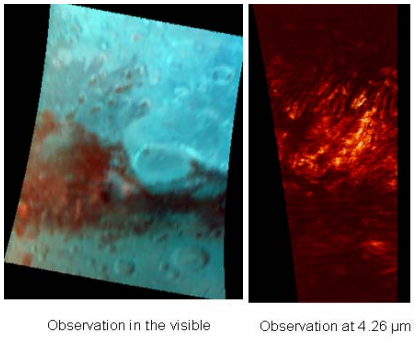

Figure 1: observations of CO2 clouds with Omega using the visible chanel (on the left) and the 4.26 µm band (on the right)

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