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Search for carbonates on Mars with the OMEGA L channel calibrated data.

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Our work focuses on the search for carbonates on the surface of Mars with the OMEGA dataset. Carbonates have been long looked for because their formation is easy in aqueous media [e.g. 1] and stores large amounts of atmospheric CO2 [e.g. 2]. Previous Martian orbital missions, IRS [3] or TES [4], failed in finding large amounts of this mineral. The carbonates present strong absorption bands at 3.4 and 3.9 μm in reflectance spectra [5], which can be detected by the OMEGA L channel ([2.5-5.1 μm]) [6]. Our detection methodology is based on the depth of these bands (named after BD as the Band Depth) compared to the continuum of the reflectance spectrum. In a previous study [7] we failed in detecting significant values of this BD on regions where hydrated minerals have been observed [8,9]. The BD was also automatically assessed for the OMEGA 2000 first orbits excluding water ice detections, low signal to noise observations and isolated spurious pixels. The candidates retrieved by the processing tool were visually diagnosed but no clear carbonate detection could be obtained. The OMEGA L channel has now a correct absolute calibration up to orbit 3050 [10,11]. We here present the carbonate research results for the associated orbits that cover 70 % of the Martian surface. Nitrates and sulfates also exhibit spectral signatures in the OMEGA L channel [5], therefore we will extend our work to the search of these minerals through the same methodology.

References: [1] Morse, J. W. and G. M. Marion (1999), Am. Jour. of Sc. 299, 738-761. [2] Kahn, R. (1985), Icarus 62, 175-190. [3] Roush, T. L. et al. (1986), JGR 102, 1663-1670. [4] Stockstill, K. R. et al. (2005), JGR 110, G10004, doi: 10.1029/2004JE002353. [5] Sutter B. et al. (2007), JGR 112, G04S10, doi: 10.1029/2006JG000313. [6] Jouglet, D. et al. (2007), JGR 112, DOI:

10.1029/2006JE002846. [7] Jouglet, D. et al. (2007), 7th Mars Conf., Abs #3153. [8] Bibring, J.-P. et al. (2005), Science 307, 1576-1581. [9] Poulet, F. et al. (2005), Nature 438, 623-627. [10] Jouglet, D. et al. (2008), PSS, submitted. [11] Jouglet, D. et al. (2007), 7th Mars Conf., Abs #3157.