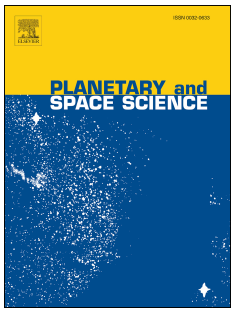
Accepted Manuscript



Aqueous alteration detection in Tikhonravov crater, Mars

F. Mancarella, S. Fonti, G. Alemanno, V. Orofino, A. Blanco

PII: S0032-0633(17)30256-8

DOI: 10.1016/j.pss.2017.12.005

Reference: PSS 4439

To appear in: *Planetary and Space Science*

Received Date: 13 July 2017

Revised Date: 11 October 2017

Accepted Date: 5 December 2017

Please cite this article as: Mancarella, F., Fonti, S., Alemanno, G., Orofino, V., Blanco, A., Aqueous alteration detection in Tikhonravov crater, Mars, *Planetary and Space Science* (2018), doi: 10.1016/j.pss.2017.12.005.

Aqueous alteration detection in Tikhonravov crater, Mars

F. Mancarella, S. Fonti, G. Alemanno, V. Orofino, and A. Blanco

Department of Mathematics and Physics E. De Giorgi, University of Salento, C.P. 193, 73100, Lecce, Italy.

Abstract

The existence of a wet period lasting long enough to allow the development of elementary forms of life on Mars has always been a very interesting issue. Given this perspective, the research for geological markers of such occurrences has been continually pursued. Once a favorable site is detected, effort should be spent to get as much information as possible aimed at a precise assessment of the genesis and evolution of the areas showing the selected markers. In this work, we discuss the recent finding of possible deposits pointing to the past existence of liquid water in Tikhonravov crater located in Arabia Terra. Comparison of CRISM spectra and those of laboratory minerals formed by aqueous alteration has led us to the conclusion that the studied areas within the impact crater host phyllosilicates deposits. In addition, analysis of the CRISM spectra has resulted in the tentative identification of carbonates mixed with phyllosilicates.

Keywords: Mars Surface, Infrared observations, Aqueous Alteration, Image Processing

1. Introduction

Since the days of the Mariner 9 spacecraft, several geomorphological features, such as valley networks (Masursky, 1973; Carr & Clow, 1981; Carr & Malin, 2000; Williams & Phillips, 2001; Craddock & Howard, 2002), lakes (Goldspiel & Squyres,

[1]Corresponding author. E-mail address: francesca.mancarella@le.infn.it