

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – missions current and future (3A)

Author: Ms. Heyam Alblooshi
United Arab Emirates Space Agency, United Arab Emirates, h.alblooshi@space.gov.ae

EXAMINING THE POSSIBLE USAGES OF MODULATING RETRO-REFLECTORS TO STUDY THE
MARTIAN ATMOSPHERE: MISSION CONCEPT

Abstract

Modulating retro-reflectors (MRR) systems have various usages and many applications where they combine an optical retroreflector and a modulator to reflect optical signals to their sources with minimal power required to operate them. The paper would be studying the possible usage of these systems on Mars to study the Martian atmosphere. First, the paper will present the technology behind these unique systems. Then the present efforts in using MRRs in Space applications will be presented in the paper and discussed in details. Based on the knowledge obtain from the literature, the paper will present a concept of a mission to use MRR on Mars to study several aspects of the Martian atmosphere such as wind speed and temperature gradient. The paper will present the advantageous of using such systems in preserving power in future Mars missions. In addition, the difficulties of using MRR will be highlighted with recommendations on how to overcome them. There might be time for the team to create a small prototype of the system to be presented in the IAC 2018.