SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – Part 2 (3B)

Author: Dr. Nildeep Patel
Airbus Defence and Space Ltd, United Kingdom, nildeep.patel@airbus.com

Dr. Richard Slade
EADS Astrium, United Kingdom, richard.slade@airbus.com
Dr. Jim Clemmet
Astrium UK, United Kingdom, jim.clemmet@airbus.com

# PRELIMINARY RESULTS FROM THE TRACTION PERFORMANCE TESTING OF THE EXOMARS ROVER LOCOMOTION PERFORMANCE MODEL

## Abstract

ExoMars is the 2018 joint NASA-ESA mission to Mars with a goal to land a 300kg rover on the Red Planet. Astrium UK has been selected as the contractor for the Rover Vehicle with Thales Alenia Space (Italy) as the Mission Prime by the European Space Agency (ESA) for the ExoMars project. This paper details the efforts of the Rover Vehicle team in selection, breadboarding and testing of the ExoMars Rover Vehicle prototype – the Locomotion Performance Model (LPM).

The primary focus of this paper is concerned with the investigation of the locomotion performance via extensive testing of the 3-bogie concept implemented on the LPM. The locomotion system enables the rover to traverse across the rugged terrain and needs to be robust yet effective in performance. This paper will outline the principle of the chosen 3-Bogie design, the scope of breadboard testing activity and preliminary results from the testing of the LPM in the Astrium Mars Yard.

A short discussion will be presented on the challenges faced in designing a locomotion subsystem that can provide effective, efficient and reliable performance to the ExoMars Rover Vehicle whilst traversing the rugged Martian terrain. Robustness is one of the key challenges in developing an autonomous interplanetary rover and there is a continuous trade off between algorithm complexity, processing performance, reliability and performance accuracy.