MARTIAN IONOSPHERIC RESPONSE TO THE PASSAGE OF A COROTATING INTERACTION REGION: OBSERVATIONS FROM MAVEN. C. Krishnaprasad[1], S. V. Thampi[1], and A. Bhardwaj[2], [1]Space Physics Laboratory, Vikram Sarabhai Space Centre, Thiruvananthapuram 695022, India (kpchirakkil@gmail.com, smitha_vt@vssc.gov.in), [2]Physical Research Laboratory, Ahmedabad 380009, India.

Introduction: The response of Martian ionosphere to the passage of Corotating Interaction Region (CIR) of June 2015 is studied using observations from several instruments aboard the Mars Atmosphere and Volatile EvolutioN (MAVEN) mission [1]. CIR is produced in the interplanetary space when a fast solar wind stream from a coronal hole interacts with a slow solar wind stream. The coronographs during the period indicate the presence of persistent coronal holes for several solar rotations [2]. An intense CIR arrived at Mars on 22 June 2015, during which the upstream solar wind and interplanetary conditions were monitored by the Solar Wind Ion Analyzer, Solar Wind Electron Analyzer, MAGnetometer, and Solar Energetic Particle instruments aboard MAVEN.

Observations: The stream interaction event was characterized by enhancements in solar wind density, velocity, dynamic pressure, increased and fluctuating interplanetary magnetic field, and was accompanied by accelerated solar energetic particles (energetic electrons and protons) [2, 3]. The LPW (Langmuir Probe and Waves) instrument onboard MAVEN provided the ionospheric observations such as electron density and electron temperature during this period. The dayside ionosphere is significantly compressed only near the peak of solar wind dynamic pressure enhancement (~14 nPa). This response is similar to the dayside ionospheric response to an interplanetary coronal mass ejection [4]. In contrast, on the nightside, we observe that the electron density remains depleted for a longer period of time. The electron temperatures are also enhanced during the period of electron depletion on the nightside. The STATIC (SupraThermal And Thermal Ion Composition) measurements show enhanced fluxes of heavy ions in the Martian exosphere during CIR period, and evidences for enhanced tailward flow of these pick-up ions. The analysis shows that the nightside ionosphere is primarily controlled by the precipitating solar energetic particles and pick-up ions transported across the Martian terminator, and depletes significantly when the heavy ion flux in the exosphere enhances. The observations indicate that the low density mass loaded tailward flow is the major candidate for depleting the topside nightside ionosphere.

References: [1] Jakosky, B. M. et al. (2015), *Space Science Reviews*, 195, 3–48. [2] Lee, C. O. et al. (2017), *JGR Space Physics*, 122, 2768–2794. [3] Thampi, S. V. et al. (2019), *ApJL*, Submitted. [4] Thampi, S. V. et al. (2018), *JGR Space Physics*, 123, 6917–6929.

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