A 3D MULTI-FLUID MHD STUDY OF THE INTERACTION OF THE SOLAR WIND WITH THE IONOSPHERE/ATMOSPHERE SYSTEM OF MARS.

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We use our new four species multi-fluid model to study the interaction of the solar wind with Mars. The lower boundary of our model is at 100 km, below the main ionospheric peak, and the radial resolution is about 10 km in the ionosphere, thus the model does a very good job in reproducing the ionosphere and the associated processes. We carry out calculations for high and low solar activity conditions and establish the importance of the extended exosphere of Mars. We also calculate the atmospheric escape of the ionospheric species and the added contributions from charge exchange in the exosphere. Finally, we compare our model results with the Viking, MGS and Mars observations.