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Mars atmospheric losses induced by the solar wind: current knowledge and perspective

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Solar wind induced atmospheric losses have been studied since earlier 1970th. Several loss channels have been identified including pick-up of exospheric photo-ions and ionospheric ions escape. Measurements performed during several solar cycles showed variation of these losses by about factor of 10, being largest at maximum solar activity.
MAVEN spacecraft equipped with comprehensive set of instruments with high temporal and mass resolution operating at Mars since fall 2014 ensures much better investigation of solar wind enforcing Martian environment, Mars atmospheric losses processes and mass loss rate. These issues are very important for understanding of Martian atmospheric evolution including water loss during cosmogonic time. Simultaneous observations by MAVEN and MEX spacecraft open the new perspective in study of Martian environment.
In this report we discuss results of past and current missions and preliminary analysis of heavy ions escape using simultaneous measurements of MEX and MAVEN spacecraft.