Geophysical Research Abstracts
Vol. 12, EGU2010-14266, 2010
EGU General Assembly 2010

Effect of an intense meteorite bombardment period on the atmospheric evolution of Mars

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Early in its history, Mars probably had a denser atmosphere with sufficient greenhouse gases to sustain the presence of stable liquid water at the surface. Previous studies have showed that asteroid impacts could affect the atmospheric evolution not only by causing atmospheric erosion but also by delivering material and volatiles to the planet. Here, we investigate the atmospheric loss and the delivery of volatiles during a period of intense bombardment of meteorites, with the help of a simplified semi-analytic model that takes into account the impact simulation results and the flux of impactor estimates derived from the NICE model of solar system evolution.