



Effect of impacts on the atmospheric evolution of Mars

L.-B.-S. Pham, Ö. Karatekin, V. Dehant

Royal Observatory of Belgium, Brussels, Belgium (LeBinhSan.Pham@oma.be,
ozgur.karatekin@oma.be, v.dehant@oma.be)

Early in its history, Mars probably had a denser atmosphere with sufficient greenhouse gases for sustaining the presence of stable liquid water on the surface. Impacts by asteroids and comets could have played a significant role in the evolution of the Martian atmosphere, not only by causing atmospheric erosion but also by delivering volatiles to the planet. We investigate the atmospheric loss, delivery of volatiles and impact flux separately and use a semi-analytical model to evaluate the atmospheric mass evolution of Mars. Preliminary results suggest that the atmospheric pressure at the Late Noachian (3.5-4 Gyr ago) cannot exceed ten times the present martian pressure and that impacts by asteroids can be a source of volatiles rather than a factor of erosion.