EPSC Abstracts,
Vol. 2, EPSC2007-A-00075, 2007
European Planetary Science Congress 2007

Warming the late archaean early Earth

P. von Paris(1), J.L. Grenfell(1), P. Hedelt(1), H. Rauer(1,2), B. Stracke(1)

(1) Extrasolare Planeten und Atmosphären, Institut für Planetenforschung, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Rutherfordstraße 2, 12489 Berlin, Germany (2) Zentrum für Astronomie und Astrophysik, Technische Universität Berlin (TUB), Hardenbergstr. 36, 10623 Berlin, Germany

The solution of the faint young Sun problem on early Earth by invoking high levels of atmospheric methane in addition to carbon dioxide has widely been accepted. Recent sediment studies, however, reveal great variations of atmospheric carbon dioxide levels throughout the early Earth history. Simulations of the climate of early Earth with a new radiative-convective model show that during the frequent periods of high atmospheric carbon dioxide levels, no additional greenhouse gas is needed to achieve moderate surface temperatures, contrary to previous studies.