Geophysical Research Abstracts
Vol. 14, EGU2012-2350, 2012
EGU General Assembly 2012

Parametric Theory of Climate Change

R. Boschi (1) and V. Lucarini (2)

(1) Institute of Meteorology, KlimaCampus, University of Hamburg, Hamburg, Germany (robert.boschi@zmaw.de), (2) Institute of Meteorology, KlimaCampus, University of Hamburg, Hamburg, Germany (valerio.lucarini@zmaw.de)

We investigate how the fundamental properties of the climate system are affected by changes in the solar irradiance and in the concentration of GHGs by exploring a very vast parametric range. We perform a large set of simulations using a simplified yet realistic climate model. We construct a 2D bistability diagram characterising the coexistence of snowball and snowfree conditions and construct simplified parameterisations of the main dynamic and thermodynamic quantities. We also explore the transitions between the two states and describe them in terms of changes in the thermodynamic efficiency and entropy production of the system.