



A Scaling Model for the Forced Climate Variability over Multi-Centennial Scales

Raphael Hébert and Shaun Lovejoy
McGill University, Physics, Canada (rphlhbtr@gmail.com)

Separating internal variability from forced variability has become a crucial question, especially with the recent increase in anthropogenic forcing which adds complexity to comparisons of paleo and modern data. We explore new ways to characterize the forced temperature variability using a scaling model operating within the linear response framework with a power-law scaling climate response function (SCRF), the Green's function. Industrial era observations are used to estimate the best parameters of the SCRF. Using pre-industrial forcing reconstructions, we can calculate the expected forced mean temperature over the northern hemisphere and verify that it is consistent with multi-proxy temperature reconstructions over the last millenium. We assess whether the forced variability obtained is sufficient to explain low-frequency variability in the pre-industrial period, and the answer depends on the specific multi-proxy reconstruction considered for verification.