



A modeling study with a dynamical global vegetation model and last millennium GCM experiments to understand change of atmospheric CO₂ level and terrestrial carbon storage during the last millennium: Sensitivity of terrestrial carbon to solar and volcanic forcings

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Reconstruction of paleo-environment from 850AD to pre-industrial (1850AD) indicates warmest temperature in the Medieval Warm Period (MWP: ca. 1000AD to 1200AD) and coldest temperature in the Little Ice Age (LIA: ca. 1600AD to 1800AD). On the other hand, reconstruction of atmospheric CO₂ level shows the highest value around the MWP and lowest value around the LIA. Paleoclimate modeling community is trying to reproduce and understand the climate and CO₂ change during this “last millennium” by using general circulation models (GCMs) and earth system models (ESMs). However, there is still discrepancy among models. In the present study, we run multiple last millennial GCM sensitivity experiments with two solar forcings and two volcanic forcings. Then we use a dynamical global vegetation model “Land Processes and eXchange (LPX)” forced by these GCM results as input, in order to investigate how solar and volcanic forcings affect to the terrestrial carbon storage.