

The role of vegetation change upon polar amplification in warm climate by feedback analysis

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Previous studies revealed that vegetation change in high latitude (e.g. from tundra to forest) in warm climate strengthens a polar amplification. This is due to lower vegetation albedo of forest than tundra, snow-albedo feedback caused by early snow melt due to forest coverage and ocean heat emission in autumn and winter. In the present study, we run a vegetation-coupled general circulation model with a slab-ocean, MIROC-LPJ, for two kinds of warming experiments. One is due to higher atmospheric CO₂ concentration (2xCO₂ and 4xCO₂) and the other is due to the difference of the Earth's orbit (mid-Holocene and the Last Interglacial). The result shows different mechanisms of warming amplification between CO₂-induced vegetation feedback and orbit-induced vegetation feedback. We also try to apply a feedback analysis (Cai and Luo 2009; Yoshimori et al. 2014) to the result of MIROC-LPJ experiments.

Keywords: polar amplification, vegetation, paleoclimate