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Late Quaternary vegetation-climate feedbacks

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Abstract. Feedbacks between vegetation and other components of the climate system are discussed with respect to their influence on climate dynamics during the late Quaternary, i.e., the last glacial-interglacial cycles. When weighting current understanding based on interpretation of palaeobotanic and palaeoclimatic evidence by numerical climate system models, a number of arguments speak in favour of vegetation dynamics being an amplifier of orbital forcing. (a) The vegetation-snow albedo feedback in synergy with the sea-ice albedo feedback tends to amplify Northern Hemisphere and global mean temperature changes. (b) Variations in the extent of the largest desert on Earth, the Sahara, appear to be amplified by biogeophysical feedback. (c) Biogeochemical feedbacks in the climate system in relation to vegetation migration are supposed to be negative on time scales of glacial cycles. However, with respect to changes in global mean temperature, they are presumably weaker than the positive biogeophysical feedbacks.

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