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An assessment of the stability of the teleconnection between the summer North Atlantic Oscillation and climate in East Asia during the last millennium

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In a recent study, a teleconnection linking the summer North Atlantic Oscillation (SNAO), which exerts a strong influence on European climate (e.g. rainfall, temperature and cloudiness), and summer climate in East Asia was found for the latter half of the twentieth century. This teleconnection, which is partly induced by stationary wave propagation, is associated with the large-scale atmospheric circulation over the high-latitude Northern Hemisphere, and may be useful for seasonal forecasting of e.g. the East Asian summer monsoon. However, due the limited time period in which observational data is available, it is difficult to assess the temporal stability of the proposed teleconnection.

Here we utilize a tree-ring based reconstruction of the SNAO as well as a number of proxies (e.g. tree-ring data and ice core data) for European and East Asian climate (e.g. temperature and the summer monsoon) to investigate the temporal stability of this teleconnection over the last millennium. The results tentatively suggests that a relationship between SNAO and Chinese summer climate do exist back in time, especially on multidecadal timescales. This association may result of common responses to changes in the large-scale ocean circulation associated with the AMO.