## C20C - Climate of the 20th Century: Interannual teleconnections between the summer North Atlantic Oscillation and the summer East Asian monsoon.

Hans Linderholm<sup>†</sup>; Tinghai Ou; Jee-Hoon Jeong; Chris Folland; Daoyi Gong; Hongbin Liu; Yu Liu; Deliang Chen <sup>†</sup> University of Gothenburg, Sweden

Leading author: <u>hansl@gvc.gu.se</u>

Summer climate in the North Atlantic-European sector possesses a principal pattern of year-to-year variability similar to the North Atlantic Oscillation in winter. This 'Summer North Atlantic Oscillation' (SNAO) is defined as the first EOF of July-August extratropical North Atlantic pressure at mean sea level. The SNAO exerts a strong influence on European climate, e.g. rainfall, temperature and cloudiness, but is also associated to climate variability elsewhere, e.g. eastern North America and northern Africa. Modelling and observational results indicate that SNAO variations are partly related to the Atlantic Multidecadal Oscillation (AMO) on interdecadal time scales. Here we present a study of the relationship between July-August (JA) mean climate over China, including the East Asian summer monsoon (EASM), and SNAO. Analyzing the variations of temperature, precipitation and cloud cover related to the SNAO for the period 1951-2002 using gridded datasets as well as instrumental data from China, it was shown that the major patterns of summer climate over China are highly connected with the inter-annual variation of the SNAO, supporting a teleconnection between the North Atlantic region and East Asia. Our results suggest that this teleconnection between the North Atlantic region and the East Asian Monsoon, particularly evident over China, arises from i) near simultaneous responses of the atmospheric circulation in East Asia and the positive/negative phases of the SNAO, where both are part of the large-scale high-latitude circulation teleconnections in the summer Northern Hemisphere, and ii) propagation of the SNAO signal to eastern China in about one week after the maximum of a positive or negative SNAO event. The results are encouraging for better understanding extratropical influences on summer East Asian climate, especially the EASM, and may provide useful guidance for improving the detailed performance of seasonal climate models and thus seasonal forecasting of East Asian, particularly Chinese, summer climate. Because of the hemispheric nature of these teleconnections, there are implications for climate models generally. The study is in press in Journal of Geophysical Research, doi:10.1029/2010JD015235.