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Title: *Projected change of Arctic summer cyclone activity by CMIP3 models*

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Rapid climate change is occurring in the Arctic, which is warming at rate twice faster than the global average in the annual mean, as a result of polar amplification. Several climate parameters, such as surface temperature, upper ocean temperature, or soil temperature in the sub-Arctic, indicate strong changes in the summer and autumn season when Arctic sea ice extent decline is the largest. It is hence of great importance to understand and to model accurately the various components of the coupled ice-ocean-atmosphere system in the Arctic during the summer season. Storms and cyclones constitute a key component of the extratropical atmospheric circulation, transporting heat and moisture poleward. In addition to the year-round Atlantic and Pacific mid-latitude storm tracks, there is, in the summer, a region of enhanced cyclone activity stretching from Northern Eurasia across the Arctic Ocean, termed the Arctic Ocean Cyclone Maximum (AOCM). We carry out a systematic multi-model comparison addressing the reproducibility of the Arctic summer storm tracks in CMIP3 climate models, and of the factors that might govern inter-model variability, such as the enhanced meridional temperature gradient between the Arctic Ocean and the warming Eurasian continent. We examine both current climate conditions, when the multi-model mean is benchmarked against re-analyses from the Japan Meteorological Agency, and one future global warming scenario.