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Atmospheric Rivers over the Arctic with the ICON model

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The Arctic climate changes faster than the ones of other regions, but the relative role of the individual feedback mechanisms contributing to Arctic amplification is still unclear. Atmospheric Rivers (ARs) are narrow and transient river-style moisture flows arriving from the sub-polar regions. The

integrated water vapour transport associated with ARs can explain up to 70% of the precipitation variance north of 70°N. However, there are still un-

certainties regarding the specific role and the impact of ARs on the Arctic climate variability.

For the first time, the high-resolution ICON modelling framework is used over the Arctic region (from 13 km down to ca. 6 and 3 km) to investigate processes related with anomalous moisture transport into the Arctic. Based on a case study for Svalbard, the representation of the atmospheric circulation and the spatio-temporal structure of water vapour, temperature, and precipitation and snowfall within the limited-area mode (LAM) of the ICON model is assessed. Preliminary results show that the moisture intrusion is relatively well represented in the ICON-LAM simulations. The impact on the surface energy budget will also be calculated.