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Impact of latent heat, SST and orography on a high-impact cyclone moving over Scandinavia

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In August 2003, Central Norway was hit by extreme precipitation. The cyclone to which the precipitation was associated is simulated numerically and several sensitivity studes are carried out. The simulations reveal that the release of latent heat had a major impact on the development of the cyclone. The cyclone occurred during a period of anomalously high sea surface temperatures (SST). Numerical tests show however that the development of the cyclone and the extreme precipitation are not sensitive to the SST. Removing the orography of Scandinavia leads to a deformation of the cyclone; a lee trough is formed over SE-Norway where the orography is present and the pressure gradient to the west of the low as it moves over E-Norway is stronger in the control simulation than where there are no mountains. The results will be helpful in analysing similar events in coarse-resolution climate simulations, where the mountains are poorly resolved.