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Long-term Arctic homogenized radiosondes

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Radiosonde measurements are potentially valuable indicators of upper air climate change because of their unique long-term availability and their high vertical extent and resolution. The radiosonde network, however, is not a long-term stable measurement system, since it was designed for operational use. Changes in the observation system are frequent and surf the purpose of competitive daily weather prediction, but result in more or less clear breakpoints in the observed long-term time series. These artificial biases need to be removed. We apply a bias adjustment scheme for radiosonde temperatures and humidity based on departures from a recent reanalysis, ERA5 potentially back to 1950. Newly digitized and recovered radiosonde data have been used within ERA5 for the first time. We present long-term bias adjustments and trends as preliminary results. In particular, we focus on the water vapour transport into the Arctic as a result of polar amplification and meridional heat exchange.