Assessing large scale trend recovery in radiosonde temperature homogenisation

H. Titchner (1), P. Thorne (1), M. McCarthy (1)

(1) Met Office Hadley Centre, UK

Debate continues over tropical tropospheric temperature trends during the satellite era. The challenge of identifying and correcting discontinuities within radiosonde data has resulted in different trend estimates from recently developed datasets. However, the structural uncertainty and potential systematic bias that results from the different choices that could be made during data set construction are poorly quantified. We have developed an automated data set homogenisation system for assessing these issues in HadAT, our radiosonde temperature data set (available at www.hadobs.org). This system is able to produce an ensemble of dataset realisations by randomly setting the system parameters akin to making different methodological decisions. Here we assess the ability of the system to recover the true long term trends using realistic validation experiments. Four error models containing known discontinuities are generated using different assumptions and applied to simulated data from an atmosphere only GCM run with prescribed SSTs and human and natural forcings. As the 'truth' is known we can assess how well the system recovers the original model trend in each of the four test cases. This allows us to interpret the observed trends in terms of our validation results.