



Temperature Trends from Homogenized German Radiosonde Data

Margit Pattantyús-Ábrahám and Wolfgang Steinbrecht

Deutscher Wetterdienst, Meteorological Observatory, Hohenpeissenberg, Germany (Margit.Pattantyus-Abraham@dwd.de)

We present homogenization procedure and results for Germany's historical radiosonde records, dating back to 1950. Upper-air temperature records have been homogenized manually. The method makes use of the different RS networks existing in East and West-Germany from the 1950s until 1990. The largest temperature adjustments, up to 2.5K, apply to Freiberg sondes used in the East in the 1950s and 1960s. Adjustments for Graw H50 and M60 sondes, used in the West from the 1950s to the late 1980s, and for RKZ sondes, used in the East in the 1970s and 1980s, are also significant, 0.3 to 0.5K. Small differences between Vaisala RS80 and RS92 sondes used throughout Germany since 1990 and 2005, respectively, were not corrected for at levels from the ground to 300 hPa. Comparison of the homogenized data with other radiosonde datasets, RICH and HadAT2, and with Microwave Sounding Unit satellite data, shows generally good agreement. HadAT2 data exhibit a few suspicious spikes in the 1970s and 1980s, and some suspicious offsets up to 1K after 1995. Compared to RICH, our homogenized data show slightly different temperatures in the 1960s and 1970s. We find that the troposphere over Germany has been warming by $0.25 \pm 0.1\text{K}$ per decade since the early 1960s, slightly more than reported in other studies. The stratosphere has been cooling, with the trend increasing from almost no change near 230hPa (the tropopause) to $-0.5 \pm 0.2\text{K}$ per decade near 50hPa. Trends from the homogenized data are more positive by about 0.1K per decade than for the original data, both in troposphere and stratosphere.