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Temperature Measurement Comparability in the Presence of a Stratospheric Warming

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The MaCWAVE (Mountain and Convective Waves Ascending Vertically) campaign that took place from ESRANGE, Sweden in January 2003 provided extremely useful inflatable falling sphere temperature profiles. The time distribution of the measurements allowed us to portray changes occurring in the atmospheric structure during a stratospheric warming and also permitted us to examine the comparability of in situ and remotely measured temperatures, especially data from SABER and AIRS and the U. Bonn Lidar also operating at ESRANGE. Sphere and retrieved temperature profiles followed changes occurring in the stratospheric warming event, e.g. temperature increase, decrease, and the recovery. It is unavoidable that the remote source measurements were not always coincidental in time or space with the falling sphere measurements. However, we illustrate how well both types of measurements represent the polar winter atmosphere during this STRATWARM event. Our examination of these data indicates that they provide reasonably similar temperature profiles. We also identify whether differences between the two types of measurements were within acceptable accuracy bounds.