Atmospheric
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Supplement of

Impact of a strong volcanic eruption on the summer middle atmosphere in UA-ICON simulations

Sandra Wallis et al.

Correspondence to: Sandra Wallis (sandra.wallis@uni-greifswald.de)
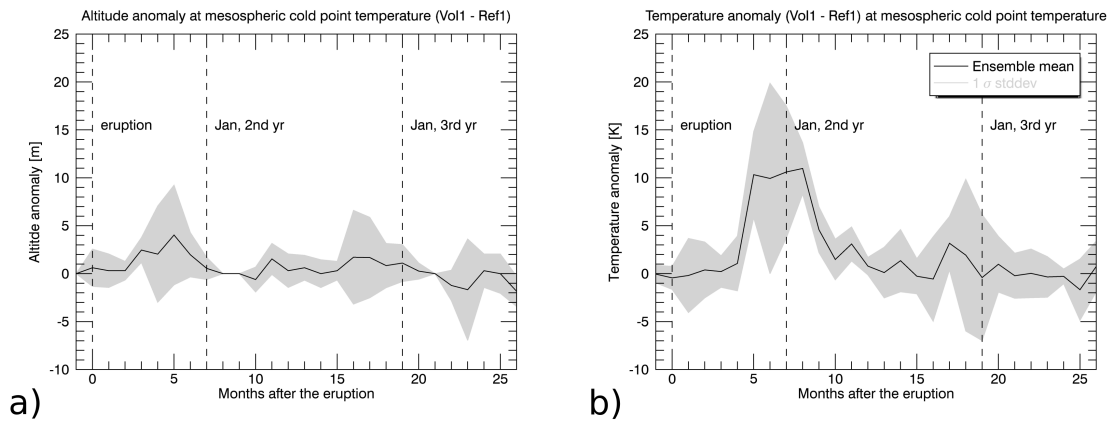
Figure S1. Time series of the (a) altitude and (b) temperature anomaly of the mesospheric cold point. Gray shading indicates 1 standard deviation of the 10 ensemble member anomalies (Vol1 - Ref1). The date of the eruption as well as of the first and second post-eruption Novembers are marked with dash lines.
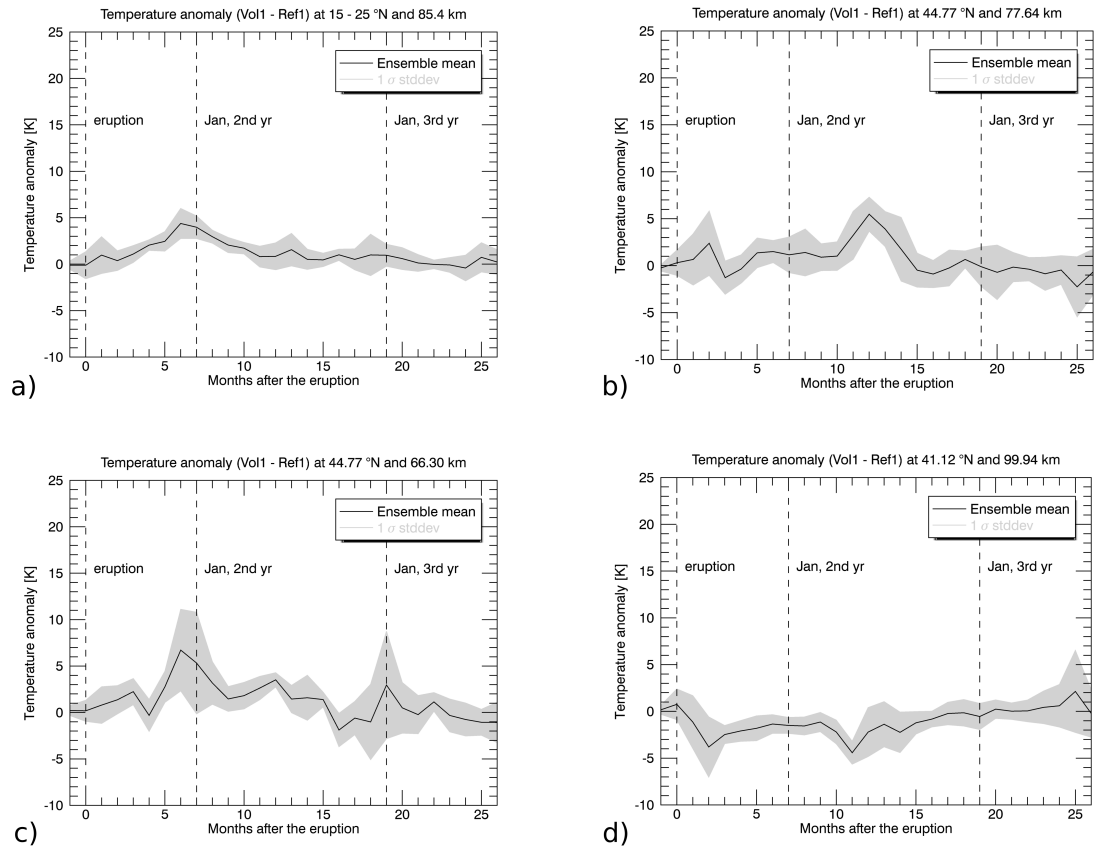
Figure S2. Time series of temperature anomaly (Vol1 - Ref1) for a) 15-25°N and 85.4 km altitude, b) 44.77°N and 77.64 km altitude, c) 44.77°N and 66.30 km altitude and d) 41.12°N and 99.94 km altitude. The gray areas in b)-d) indicate the 1-σ standard deviation. The gray areas in a) show the mean of the ensemble mean temperature anomaly standard deviations for all latitudes averaged between 15-25°N.
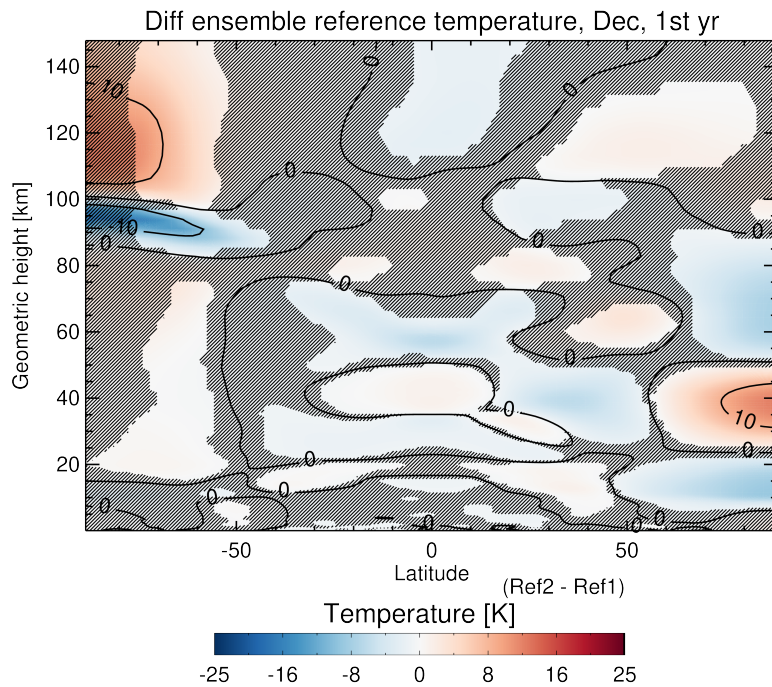
Figure S3. Difference of the reference runs (Ref2 - Ref1) for the first December after the simulated eruption. The reference runs differ in the sub-grid scale orographic parameterization. The summer mesopause region between 85 - 100 km altitude shows a negative anomaly that is significant between 80 - 40°S. The polar winter stratosphere between 20 - 50 km shows a positive anomaly with a negative anomaly above up to 90 km altitude. Hatched areas are not significant at a 95% confidence interval using a Student's t-test.