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Xiaoyu Ren

Institute of Atmospheric Physics, Beijing, China, Key Laboratory of middle atmosphere and Global Environmental Observation, Beijing, China (nuistrxy@163.com)

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Xiaoyu Ren, nuistrxy@163.com
Yi Liu, liuyi@mail.iap.ac.cn
Institute of Atmospheric Physics, CAS, Beijing, China

Small-scale turbulence in the upper troposphere and lower stratosphere (UTLS) impacts many aspects of atmospheric physics and chemistry, so it is significant to addresses the properties of turbulence in the UTLS. We plan to do the balloon soundings experiments with the constant temperature anemometer (CTA) at Tibetan Plateau. The CTA samples wind turbulence at 2kHz, thus a vertical resolution of 2.5 mm can be reached at 5m/s ascent speed, and it is possible to study the entire turbulence spectrum down to the viscous subrange. Using the high frequency equipment aims to investigate some statistics and the spectral characteristics of stably-stratified and unstable layers respectively.
With the wind vertical profiles, the vertical stratification of the atmosphere and the exchange between the troposphere and stratosphere could be studied. Furthermore, it's necessary to combine the WRF multiscale resolution simulation with the experimental data. Vertical nesting coupled mesoscale and microscale models are presented with a particular emphasis on improved vertical resolution in the UTLS. The microscale nests are used to resolve the localized shear layers
and sharp gradients of vertical velocity and other multiscale physics. The experiment results are applied to validate the model simulation of the stratospheric turbulence and explore the relationship between gravity waves and turbulence.