

Testing the transfer functions for Geonor T-200B and Chinese standard precipitation gauge (CSPG) in the central Qinghai-Tibet Plateau

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Abstract

Geonor T-200B weighing precipitation gauge (Geonor) and Chinese standard precipitation gauge (CSPG) are widely used for measuring precipitation in the Qinghai-Tibet Plateau. However, their measurements must be adjusted due to wetting, evaporation loss and wind-induced undercatch. Some transfer functions had been proposed in previous studies, but their applicability in the Qinghai-Tibetan Plateau has not been evaluated. In our study, a precipitation measurement intercomparison experiment was carried out from August 2018 to September 2020 at a station in the central Qinghai-Tibet Plateau, and these transfer functions are also evaluated based on the results of the experiment. The results show that: (1) the catch efficiency of Geonor for rain, mixed, snow, hail are 92.06%, 85.32%, 68.08% and 91.82% respectively, and the catch efficiency of CSPG are 92.59%, 81.32%, 46.43% and 95.56% respectively. (2) K2017b has the most accurate correction results for Geonor solid and mixed precipitation at 30 minutes time scale, and the M2007e scheme has the most accurate correction results for Geonor solid precipitation at event scale. (3) The current transfer functions for CSPG underestimate the solid precipitation, while overestimate the liquid precipitation. Based on the results of the comparative observation in our study, new CSPG transfer functions are proposed for the central Qinghai-Tibet Plateau. (4) Hail is also an important precipitation type in the central Qinghai-Tibet Plateau. Because the capture rate of hail precipitation is close to that of rain, and the temperature when hail precipitation occurs is high, it is not necessary to determine the hail precipitation type, and the transfer functions recommended in this study can also get a good correction results.

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