# Comparison of automatic snowfall measurements by laser, ultrasonic snow depth meters

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## Abstract

The estimation of initial snow depth is important to issue a heavy-snowfall watch and warming. However, the automatic measurement network of snow depth which replaces the hourly-manual measurement has a limitation to estimate the initial snow depth due to its low accuracy. Its estimation is not easy to assess because the gauge point is varied by the sinking and rising of soil layer during the melting of snow. Moreover, there is the lack of domestic researches on the initial snow depth to evaluate snow depth data from the automatic measurement network. To improve the accuracy of initial and accumulated snow depth measurement, a test-bed with laser and ultrasonic snow depth meters was built at the Cloud Physics Observation System (CPOS) in 2009 and have been analyzed the characteristics of each initial snow depth meters by the intercomparison study. Also, the properties of three snow depth measurements including plates and surfaces have been studied to minimize the errors of < 5cm of initial snow depth from a laser snow depth meter by considering and conducting the experiment of sinking and rising of soil layers around snow depth measurement plates.

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