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# Sea level change from BeiDou Navigation Satellite System-Reflectometry (BDS-R): First results and evaluation

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## Abstract

Sea level changes affect human living environments, particularly ocean coasts. The tide gauges (TG) can measure sea level change, while it is the relative variations with respect to the land. Recently, GPS-Reflectometry (GPS-R) has been demonstrated to measure sea level change using dual-frequency data. With the rapid development of China's BeiDou Navigation Satellite System (BDS), it may provide a new possible opportunity to monitor sea level changes with three frequencies (L2, L6 and L7). In this paper, BDS-Reflectometry (BDS-R) is the first time used to estimate the sea level changes based on Signal-to-Noise Ratio (SNR) data and triple-frequency phase and code combinations, which are compared to tide gauge observations. Results show that sea level changes from BDS SNR and phase combination have a good agreement with correlation coefficients of 0.83-0.91 and RMSEs of less than 0.6m, while BDS code combination is not as good as others. Furthermore, a new negative linear model between phase and code peak frequencies and tide gauge observations is further obtained and

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