Response Characteristics of Groundwater Level to Barometric Pressure and Earth Tide in Moderate and High Frequency Band

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The completion of digital transformation of China's precursor observation network has widen the frequency range for extracting earthquake preparation related information and removing disturbance effects from groundwater, and made it possible for review some of the previous knowledge. In this paper, we picked out 10 stations with best water level and barometric pressure data from Center for the Earthquake Precursory Observation Network of China, analyzed the spectrum characteristics and correlation traits of groundwater level, barometric pressure and earth tide of each station from Jan.1 to May 11, 2008, and discussed the time-lapse of groundwater to barometric pressure. It showed that the response of groundwater level to barometric pressure in moderate and high frequency band was not as good as that in low frequency band and their correlation decreased with the decline of cycle; the lithologic characters of the well-aquifer systems had a great impact on the response characteristics of groundwater level to barometric pressure and earth tide in moderate and high frequency band. In several limestone wells there existed abnormal response characteristics of groundwater level to barometric pressure in high frequency band; time-lapse of groundwater level to barometric pressure had little effect on the overall response characteristics between them in frequency band, reflecting the complexity of their own.

Key words: groundwater level; barometric pressure; earth tide; response characteristics; frequency band.