

Ten-year trend of water level in the Nagura dam lake, Ishigakijima, Japan, observed by the F-net IGK broadband seismometer from 2012 to 2022

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The STS-2 broadband seismometer at the F-net IGK station on Ishigakijima Island, Okinawa, Japan, can observe the oscillations associated with the seiche of the dam lake immediately south of the station. The oscillation predominant in the NS component is monochromatic and its frequency varies from 7 to 11 mHz. The observed frequency change agrees well with the water level change of the dam lake. The observed frequency and the water level of the dam lake show 11 mHz at the full water level (50 m above sea level), and there is an approximate relationship between a 1 m drop in water level and a 1 mHz drop in frequency. In this study, the frequency change of monochromatic oscillation is investigated using F-net IGK LHN data for 10 years from 2012, and the water level change of the dam lake obtained from the empirical equation is shown. We also attempt to explain the observed values using a simple Seiche model assuming a rectangular tank model.