The surface seiches of Lake Trichonis (Greece)

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Lake Trichonis, the largest and deepest lake in Greece, is situated in the Aitoloakarnania region of western Greece. The lakes' surface area is 96.9 Km , its length is 20 Km and its greatest width is 6.5 Km (fig.1). The mean depth is about 40m. The Lake is divided into two basins. The western basin is less than 30m deep while the eastern basin has a maximum depth of 57m. The Lake is oligotrophic and exhibiting orthograd distribution of dissolved oxygen (KOUSOURIS, 1981). High hardness and transparency and salt nutrients appearing in low concentrations, heating and cooling are responsible for the stable thermal stratification and uniformation of Lake Trichonis (ZACHARIAS, 1987). The epilimnion at summer's end attains its maximum average thickness of about 15m when the surface temperature may be as high as 30 C. The thermocline is generally very steep. During the entire year the hypolimnion has a quasi-winter temperature profile at the lake bottom where temperatures of 10 C have been recorded. At winter's end the lake is more or less homogenous.

This paper is devoted to the systematical study of the surface seiches of the gravitational oscilations in Lake Trichonis, Greece. A computational analysis of the periods and structure of surface seiches of Lake Trichonis in Greece and its experimental verification from three simultaneous water gauge recordings, mounted along the shores in Myrtia, Panetolio and Trichonio is given. The first five theoretical modes are calculated with a finite difference code of tidal equations, which yield the eigenperiods and co-range and co-tidal lines and are graphically displayed and discussed in detail.

Experimental verifications are from recordings taken during April-May 1989. Visual observations of the record permits identification of the five lowest order modes, including interstation phase shift. Power spectral analysis of two time series and interstation phase difference and coherence spectra allow the indentification of the same five modes. Agreement between the theoretically predicted and the experimentally determined periods was excellent for most of the calculated modes.

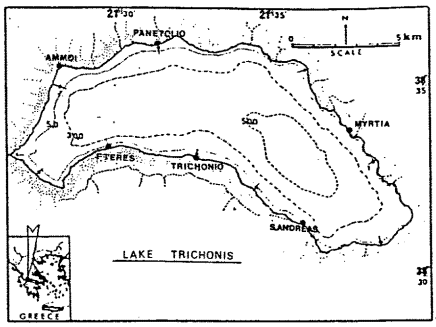

fig.1

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