

On the possibility of monitoring of the ocean tide by dense vertical electrical sounding

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In order to observe precise ground water level changes caused by the ocean tide, we carried out dense vertical electrical sounding on the Orido beach in Shizuoka. As the electrode arrangement, the Wenner configuration was employed and electrode spacing of the dense vertical electrical sounding was increased at intervals of 10 cm in the range of 3-6 m, to catch small changes of the sea level under the ground. The observations were done from 7 November to 14 November at interval of 1 hour.

Resistivity structures were estimated by inversion analysis based on the non-linear least squares method and low resistivity layer was found at the depth deeper than 4 m under the surface. In addition, it was shown that the change of the depth of the layer had periodicity of 12 and 24 hours. Thus, the depth of the layer was compared with the observed sea level in the port.

As a result, it was shown that the depth of the low resistivity layer change with time lag of 12 hours to the sea level change, and the permeability in the Orido beach was estimated to be 1.2×10^{-1} cm/s from the time lag and the distance between observation point and shoreline.