

# SEAWATER DENSITY ESTIMATION ON SURFACE FOOTPRINTS OF INTERNAL WAVES

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The problem of shallow water density estimation based on the surface images of internal gravity waves is considered. The images are used for calculation of internal gravity waves speed and wavelength. The seventeen cases of in-situ wave registration by vertical allocation temperature sensors are analyzed. The standard two-layer model and constant Väisälä-Brunt frequency model are explored. The wave speed is calculated by direct task solution using in situ data and image data separately, and the results are compared. Two kinds of direct task solutions are considered: as a solution of Sturm–Liouville problem and as a solution of Korteweg-de Vries equation. The relation between internal wave speed and the depth can help us to choose the density model. It is shown, that for the two-layer model with upper layer depth much higher than the bottom one both approaches to the solution of the direct task give significantly lower speed than the speed calculated from the image sequences.

**Key words:** internal waves, surface manifestations, density diagnostic.

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