Abstract Submitted
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Internal wave structure emitted by a horizontally oscillating sphere[1] EVGUENYI ERMANYUK, Lavrentyev Institute of Hydrodynamics (LIH), JAN-BERT FLOR, BRUNO VOISIN, Laboratoire des Ecoulements Geophysiques et Industriels (LEGI) — An oscillating body in a stratified fluid generates a double cone-shaped internal-wave pattern, the 3D analogue of the classic St.Andrew-cross. For sufficiently low frequency and large amplitude oscillations, higher-order wave harmonics may be generated along with the fundamental one. We present an experimental study of the 3D structure of first- and second-order wave fields emitted by a *horizontally* oscillating sphere. In contrast to the axisymmetric wave pattern found for a *vertically* oscillating sphere, for *horizontal* oscillations, the first- and higher-order-harmonic waves have different distributions of wave amplitudes in the azimuthal direction. The amplitude of the first-order waves is shown to follow the cosine dependence on the azimuthal angle, in accordance with theoretical predictions. The azimuthal distribution of the amplitude of the second-order waves gives evidence of a quadrupolar distribution, with four preferential directions of wave radiation in a horizontal plane, along the direction of oscillation and normal to it. Noteworthy is that the amplitudes of these second-order waves may exceed the amplitude of first-order waves.

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