Since the horizontal orbital velocity vector W_0 at the incident wave crest is assumed as a reference point, the phase jump Δφ occurs between the incident and the outgoing beam as angle of rotation $\Delta\varphi = 180^0 - 2\alpha$. Superimposing the orbital velocities (by magnitude and direction), assigned to the respective *exponentially reduced* virtual orbital circles, on those of the respective incident circular orbital motions of the initial deep water waves, the result is the represented elliptical orbits rotated by the angle α. Analogous to the optical reflection, it was taken into account that the orbital velocity vectors have opposite directions of rotation on their orbital circles.

The obtained result is shown here in principle for a wave of height H = 3.0m and length L = 38.00m with respect to the given boundary conditions.

The representations of the other parameters related to the dimensions of the associated model investigations can be taken from the original work of Büsching, Fritz (2019): „Vibration Interferences in the Limited Orbital Field of Sea Waves in Theory and Physical Model“: https://doi.org/10.24355/dbbs.084-202002031131-0.

It should be noted:

For the time being, the acceptance of the found results seems to be impaired by the fact that the author used a relatively complex spectral method developed by him for the analysis of irregular waves in his model investigations, cf. his earlier publications. This method has hardly been reproduced by other researchers.

A practically important result, which also reflects the core of the new theory, is the definition of the complex reflection coefficient $\Gamma = C_r\, e^{i\Delta\varphi}$. http://www.digibib.tu-bs.de/?docid=00062890.

This states that the reflection of water waves is not only determined by the ratio of the heights of the reflected to the incident wave ($C_r = H_r / H_i$), but also by the phase shift Δφ (phase jump) between the incident and the reflected wave, which depends on the sea bed inclination α. The author uses the expression

$$C_{r,i} = \frac{\sqrt{E_{\max,i}} - \sqrt{E_{\min,i}}}{\sqrt{E_{\max,i}} + \sqrt{E_{\min,i}}}$$

for the Fourier components (or partial waves) *i* of an energy spectrum of irregular waves. This special feature has apparently not yet been sufficiently understood by other researchers either.

Since the new theory agrees with the continuity condition and since the phase jump Δφ could be reproduced in a physical model, its proof could be considered as a link that was missing until now. If necessary, a future consideration of the phase jump Δφ could mean a paradigm shift in surf research, including the tsunami problem and even with non-linear theories.

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https://doi.org/10.24355/dbbs.084-202008031451-0