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Irregular wave transformation along a quartic bottom profile

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The random wave transformation in the basin of decreasing depth is studied for a case of a quartic bottom profile. The advantage of this bottom profile is that waves can propagate along it without inner reflection even if the bottom slope is not small. The wave transformation is studied analytically in the framework of shallow water theory. Its rigorous solution is obtained in the class of random functions. The correlation function and its spectrum (energetic wave spectrum) are calculated. The behavior of the wave spectrum transformation in a basin of decreasing depth is studied in detail. It is demonstrated that the spectrum becomes upshifted, while approaching the coast, and its high-frequency asymptotic proportional to frequency with exponent minus 3.