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## A new predictor for tsunami runup

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We present a new Tsunami Runup Predictor (TRP). The TRP includes the length of the beach slope, the length of the accelerating phase of the wave plus the amplitude ratio for leading depression waves.

We use numerical and analytical tools to compute the runup for a dataset of 210 initial tsunami waveforms. In our tests, the slope angle of the beach varies between 1 and 5 degrees and the distance of the initial wave to the coast varies between 50 and 360 km. The results show a high correlation between the TRP and the dimensionless runup, enabling the definition of an empirical formula to predict the runup.

We further test the empirical formula using a set of past events with field data. The comparison of the empirical estimates with the runup measurements of post-tsunami surveys gives promising results.

The TRP allows estimating the tsunami runup in real-time once the offshore waveform is known.

The capacity to predict the maximum runup along the coast in real-time and include it in routine operations of Tsunami Early Warning Systems will constitute an enormous advance.

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