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Tuning the Modelling System FVCOM-SWAVE for long-term Morphodynamic Applications

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In coastal waters of tidal flat systems wind-generated surface waves are an important driver of sediment- and morphodynamics. Together with wind- and tide-induced currents, waves are responsible for sediment erosion and contribute e.g. due to Stokes drift and wave induced currents to net sediment movements.

Therefore, each morphodynamic modelling system should incorporate the influence of waves in a proper manner. Present day third-generation wave models like SWAN are appropriate tools to calculate the wave climate in coastal waters for specific wind and bathymetric conditions.

However, these wave models are computationally very expensive for small scale applications, which makes it difficult (even with present supercomputers) to model the wave climate for long-term morphodynamic studies.To give a rough estimate, for the FVCOM-SWAVE modelling system the wave computational step needs about 80% of the computational time.

Therefore, our contribution deals with tuning the FVCOM-SWAVE modelling system with respect to the parameters of the wave and morphodynamic module to reach simulation intervals of several years.