In recent years, the successful realization and operation of tidal turbine prototypes has increasingly confronted engineers with marine environments that consist of high current velocities that may occur simultaneously with large wave scenarios. The complex flow field associated with such conditions makes the design of offshore foundations a particularly challenging task. In this paper, numerical methods based on Computational Fluid Dynamics are described and applied to a shape optimal design study of a gravity base foundation. The structure is analyzed for pure wave, pure current, and combined wave-current-loading. It is shown that the optimal design with respect to a minimization of horizontal forces may vary depending on the prevailing marine environments at the offshore site. Furthermore, attention is drawn to the influence of wave-current interaction on the resulting forces. Under certain conditions, the data predict a significant load increase compared to a linear superposition of pure wave and pure current-loading. It is shown that a great optimization potential for reliable structures is gained when the predominant offshore conditions are modeled accurately.
Occurences:

- Einrichtungen > Fakultäten > Ingenieurfakultät Bau Geo Umwelt > Lehrstühle > Lehrstuhl für Statik (Prof. Bletzinger) > Konferenzbeiträge > 2013

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