Analyses of Current And Wave Forces on Velocity Caps - DTU Orbit (18/10/2019)

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Velocity caps are often used in connection with for instance offshore intake sea water for the use of for cooling water for power plants or as a source for desalinization plants. The intakes can also be used for river intakes. The velocity cap is placed on top of a vertical pipe. The vertical pipe leads the water into another pipe or tunnel system. A pressure gradient generated by the water level difference between the sea and basin drives the flow through the tunnel system. The tunnel system is often in the order of a couple kilometers long. Based on CFD analyses (computational fluid dynamics) this paper investigates the current and wave forces on the velocity cap and the vertical cylinder. The Morison's force model was used in the analyses of the extracted force time series in from the CFD model. Further the distribution of the inlet velocities around the velocity cap was also analyzed in detail in the wave case.

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