Hydrodynamics and stochastic dynamics of a parametric pendulum wave energy converter

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The paper discusses a novel design of a parametric pendulum direct drive wave energy converter (PP DD WEC). The novel idea is based on the certain buoy motion along a ramp and position of the pendulum, which due to its special position within the buoy experiences reduced gravity effect. This allows the pendulum to reach a rotational motion at much low values of amplitude-frequency of the incident waves, which we could not achieve without this layout. The hydrodynamics pattern of the buoy with the pendulum is studied to take into account the hydrodynamic forces due to reflection, radiation and friction due to the buoy while interacting with waves. The WEC potential is quantified by the amount of harvested energy based on electrical energy generator.