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# **An accurate and cost efficient physical scale model of a direct driven point-absorber with constant damping power take-off**

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When it comes to ~~validating~~<sup>erify</sup> simulation results for ~~Wave~~<sup>e</sup>Energy ~~C~~converters, physical scale ~~models-experiments~~ play an important role as a cost effective preliminary stage before full-scale test ~~to~~<sup>verify-simulations</sup>. But ~~especially~~ modelling the power take-off ~~for scale models can be~~<sup>is</sup> a complex process. State-of-the-art models ~~uses~~ static friction [1] or controlled motor~~s~~ [2-4] to simulate the behavior of the ~~actual~~ power take-off generator. In simulations, ~~while-simulating~~ of an idealized generator, a constant velocity-proportional damping is often used. Controlled motors can ~~act-operate~~ this way but are relatively complex and expensive and may suffer from friction or are limited by the motor dynamics [4]. ~~Especially while~~ In particular when ~~comparing~~ physical models ~~is-to-be~~<sup>are</sup> compared to simulation~~s~~, a good parametrized model is invaluable. The model proposed here, uses eddy currents to provide a constant velocity dependent damping: Permanent magnets generate a magnetic field in which an aluminum disc, accelerated by the force acting on the buoy, rotates. As counter force, weights, attached to the disc by a rope, generate a moment to turn the disc in the opposite direction.

The system is able to provide a constant damping, while being nearly frictionless. The motion of the PTO is measured using an accelerometer, acting as a high precision<sup>ione</sup> position measurement system.

The results of 1:10 wave tank tests are compared to a numerical model based on linear potential wave theory, ~~with excellent~~. ~~Simulation and scale test results agreed very well~~<sup>agreement</sup>.

## REFERENCES

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