**State space model:**

Run “SSModel\_calc.m”

This will generate 3 versions of the 6DOF state space model from hydro data:

* Full 144 state model with radiation damping
* Reduced model with radiation damping
* Model with no radiation damping

Use this for initial investigations. A,B,C,D matrices can be used with the continuous time state-space model block in SIMULINK. Give it a 6DOF force input consisting of wave excitation forces (can be generated from the WEC-Sim model for any sea state – see below) plus control forces. Gives motion outputs (6DOF position and velocity). See EWTEC 2019 paper for details.

**WEC-Sim model:**

wecSimInputFile.m describes all the kinematics and forcing inputs for a run. Change Hs and Te for different sea states.

Run\_TDA is a batch file to do multiple runs for different Hs and Te. For each Te you need to change the StiffnessCorner and DampingCorner parameters for the passive system to be optimal. Run\_TDA gives you the look-up tables for these and it also shows you how to save the data at the end of a run.

For a single run just type wecSim at the command line and the file listed at the top of the wecSimInputFile.m will be executed. You will find lines for Hs and Te which can be changed, and similar for StiffnessCorner. DampingCorner is applied as the constant block inside the control block within the MPS\_device\_passive.slx model.

The model allows you to add your own control logic if you wish. Inside the Results folder is an example code to plot the results. You can also use this to extract the Fex and any other data you want to provide inputs to simulations using the state-space model above.