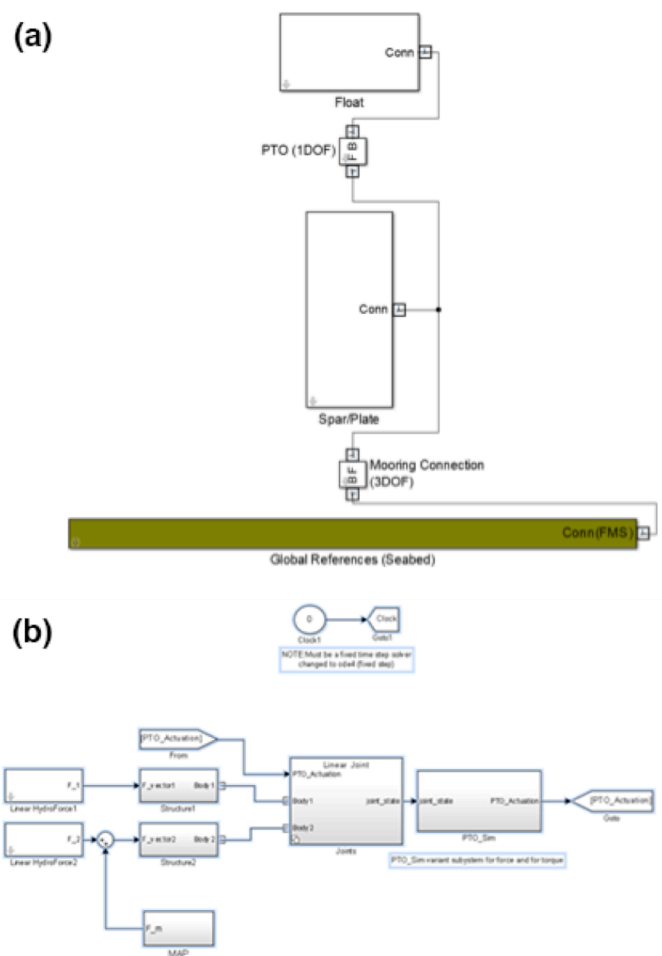# WEC-Sim Code Development Updates and Meeting

Sandia and the National Renewable Energy Laboratory (NREL) are involved in a three-year project to develop and verify WEC-Sim, an open-source numerical modeling tool to analyze and optimize wave-energy converters (WECs). The code, written in Matlab/Simulink/SimMechanics, was recently restructured significantly after its internal alpha release.

The new programming format allows users to construct the physical system based on a library of rigid bodies and joint connections, rather than requiring that the user formulate the governing WEC equations of motion. The user now has a library of WEC-Sim blocks corresponding to different body types and joints, which they use to construct their WEC as it looks physically. The figure shows the Reference Model 3 (RM3) as modeled previously (b, equation of motion) and as modeled in the new format (a, physical system).

On January 20–22, Sandia hosted NREL's Michael Lawson and Yi-Hsiang Yu for a WEC-Sim meeting held in Albuquerque, NM. During the meeting, the team focused on

- finalizing the code's transition to its new programming structure,
- making the code more user friendly, and
- creating a WEC-Sim library.

Comparison of WEC-Sim implementation for the RM3 two-body point absorber (a) using the new physical-system formulation and (b) using the old equation-of-motion formulation.

The team also successfully worked with MathWorks to overcome limitations the WEC-Sim team found when modeling WECs in the Matlab/Simulink/SimMechanics framework. The team plans to continue WEC-Sim code development using the Matlab/Simulink/SimMechanics for the code's external beta release, which is scheduled for summer 2014.

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