

## **Determining effects of Objective Function Selection and Environmental Conditions on Optimized TMD Parameters and FOWT Loading and Dynamic Response**

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In comparison to their onshore counterparts, floating offshore wind turbines(FOWTs) are capable of being built much larger as well as take advantage of better wind resources found at sea. However a significant drawback in the use of FOWTs is the increased degrees of freedom in which the turbine is capable of moving. As with any floating structure, wave and wind interactions cause force reactions and in the case of FOWTs motion of the turbine and its platform thus causing unsteady loading and increased wear on the turbine components. To mitigate these issues control system implementations such as a tuned mass dampers can be used to reduce motion and reduce loading on the FOWT. My research focuses on how optimizing the TMD parameters under different objectives such as the minimization of the standard deviation of nacelle acceleration, pitch angle, and surge displacement changes the tmd parameters and ultimately the motion and loading of the FOWT. Additionally, my research looks to see how optimizing FOWTs under different environmental conditions such as those found in eastern vs western siting locations affect the optimal tmd parameters and the tmds impact on reducing FOWT motion and loading.