

## Vibration mitigation in offshore wind turbines by tuned mass absorbers

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**Abstract:** We investigate the effectiveness of tuned mass absorbers for vibration mitigation in bottom-fixed and floating offshore wind turbines. The starting point of our study is a classical single-degree-of-freedom tuned mass absorber located within the nacelle, targeting the first natural frequency of the system. For this case, fully coupled aero-hydro-servo-elastic simulations, implemented in GH-BLADED [1], will be carried out under various wind-wave states, with the purpose of assessing fatigue behaviour of the support structure. In this context, two different support structures will be considered, a monopile and a tripod, including foundation flexibility. The next step of our study will target floating wind turbines. Innovative concepts of tuned mass absorbers will be proposed for this case, targeting one or multiple frequencies of the response. A preliminary assessment of the proposed concepts will be carried out on simplified numerical models of the system, retaining the essential aerodynamics of the rotor and hydrodynamics of the floating support.

**Keywords:** offshore wind turbine, tuned mass absorber

[1] BOSSANYI EA: *Bladed for Windows user manual*. Garrad Hassan and Partners: Bristol, 2000.