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Linear aeroelastic models used for stability analysis of wind turbines are commonly of very high order. These high-order models are generally not suitable for control analysis and synthesis. This paper presents a methodology to obtain a reduced-order linear parameter varying (LPV) model from a set of high-order linear time invariant (LTI) models. Firstly, the high-order LTI models are locally approximated using modal and balanced truncation and residualization. Then, an appropriate coordinate transformation is applied to allow interpolation of the model matrices between points on the parameter space. The obtained LPV model is of suitable size for designing modern gain-scheduling controllers based on recently developed LPV control design techniques. Results are thoroughly assessed on a set of industrial wind turbine models generated by the recently developed aeroelastic code HAWCStab2.

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Contributors: Adegas, F. D., Sønderby, I. B., Hansen, M. H., Stoustrup, J.
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