Load alleviation potential of active flaps and individual pitch control in a full design load basis

The load alleviation potential of the Controllable Rubber Trailing Edge Flap (CRTEF) is verified on a full Design Load Basis (DLB) setup using the aeroelastic code HAWC2, and by investigating a flap configuration for the NREL 5MW Reference Wind Turbine (RWT) model. The performance of the CRTEF configuration is evaluated by comparing four setups: 1) baseline with collective pitch, 2) individual pitch control, 3) individual flap control and 4) individual flap control combined with individual pitch control. The CRTEF allows for a significant reduction of the lifetime fatigue on various load channels; the reduction for some of the extreme loads is also noticeable.