

Preliminary Blade Trailing Edge Flap System Development using Conceptual Flexible Torsion Bar and Worm Drive

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Abstract

In this paper, simple but effective trailing edge flap system was proposed. This preliminary concept uses a more practical and stable actuation system which consists of motor-driven worm gear drive and flexible torsion bar. Flexible torsion bar is easy to be twisted while keeping bending rigidity as a support and worm gear drive not only provides high torque to overcome aerodynamic force on flap area and torsional rigidity of support bar, but also plays as a stopper to avoid instability due to high torsional flexibility of support bar. Preliminary level design study was performed to show the applicability of new trailing edge flap system for wind turbine blade or rotorcraft blade.

Keywords: *Blade, Wing, Tip, Torsion Bar, Composite, Piezoelectric*

Biography

Kwangtae Ha earned a PhD at Georgia Institute of Technology at 2005. After PhD, he worked at diverse fields including Caterpillar R&D Center, Groen Brothers Aviation at USA, and Samsung Heavy Industries for Wind Turbine Development, and Korea Aerospace Industries for LCH/LAH Development. He is currently working at Fraunhofer IWES as Research Associate. His current interests are conceptual testing simulation and tension-torsion coupled composite wind blade.