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Frequency modulation for a wind turbine blade-mounted ultrasonic bat deterrent[1] DANIEL CARLSON, ZARA DOWLING, PAUL SIEVERT, YAHYA MODARRES-SADEGHI, Univ of Mass - Amherst — Progress on developing a bat deterrent device for placement on the rotating blades of a wind turbine is presented. The mechanisms by which bat larynxes generate ultrasound is studied and reproduced experimentally. In previous iterations, flow-induced oscillations have been used to generate ultrasonic frequencies within the 20-70 kHz range: a range which laboratory studies have shown can deter bats from an area. However, the present work considers mechanisms which result in frequency modulation within the higher harmonics, an acoustic signal closer to what bats naturally avoid. Results discussed include the effects of spanwise tension on the flapwise oscillation of a pseudo larynx in flow, and how shifting the flapwise natural frequency allows frequency modulation. The net effect is a device effective within the range of wind speeds encountered along the length of a rotating wind turbine blade.

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