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Perching Dynamics and Development of a Simple Model MICHAEL PUOPOLO, JAMEY JACOB, Oklahoma State University, RYAN REYNOLDS, Sandia National Laboratory — Aerodynamicists with a vision for bird-like aircraft have been forced to develop new ways of modeling extremely agile flight systems, and in recent years there has been a growing variety of creative approaches that incorporate computer methods, empirical data, and unsteady flow theory. However, there remains a lack of simple and easily transferable models that can be used to predict and control motion of a fixed-wing, perching aircraft in the low Reynolds number flow regime. The authors have developed a simple dynamic model for a perching vehicle with a common fixed wing configuration that uses only input of the system design parameters, in addition to other relevant widely available information, and does not rely on wind tunnel measurements, CFD analysis or other rigorous forms of system identification. The resulting model is presented with a comparison of model simulations to flight data from a perching UAV.

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