



Phugoid Damping Control

By Nicolas J. Schindeler

Biblioscholar Nov 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x8 mm. This item is printed on demand - Print on Demand Neuware - A novel phugoid damping control design methodology is developed, based on the use of wind axes and a point-mass aircraft model. The state variables are air speed, flight path angle, and heading angle, the control variables are thrust setting, angle of attack, bank angle, and sideslip angle, and the command signals are airspeed, flight path angle, and heading angle or heading rate. All the variables and parameters are nondimensionalized. A multivariable set point controller is developed which consists of: (i) a trim calculation-based nonlinear feed-forward control computer; thus, given a commanded new trim state (air speed, flight path angle, and yaw rate), the required trim thrust setting and trim angle of attack, bank angle, and sideslip angle inputs are determined, and, (ii) a small signal linear feedback regulator; the equations of motion linearized about the trim condition of wings level, and constant altitude flight, which simplifies the dynamics to allow separation between the lateral and longitudinal control channels, are used, and a small-signal linear multivariable regulator is designed. The linear compensator also entails integral action. 134 pp. Englisch.



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