



Turbulence Hazard Metric
Based on Peak Accelerations
for Jetliner Passengers

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Turbulence Hazard Metric Based on Peak Accelerations for Jetliner Passengers

By Eric C. Stewart

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 40 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. Calculations are made of the approximate hazard due to peak normal accelerations of an airplane flying through a simulated vertical wind field associated with a convective frontal system. The calculations are based on a hazard metric developed from a systematic application of a generic math model to 1-cosine discrete gusts of various amplitudes and gust lengths. The math model simulates the three degree-of- freedom longitudinal rigid body motion to vertical gusts and includes (1) fuselage flexibility, (2) the lag in the downwash from the wing to the tail, (3) gradual lift effects, (4) a simplified autopilot, and (5) motion of an unrestrained passenger in the rear cabin. Airplane and passenger response contours are calculated for a matrix of gust amplitudes and gust lengths. The airplane response contours are used to develop an approximate hazard metric of peak normal accelerations as a function of gust amplitude and gust length. The hazard metric is then applied to a two-dimensional simulated vertical wind field of a convective frontal system. The variations of the hazard metric with gust length and airplane heading are demonstrated. This...



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