



Initiation of Long-Wave Instability of Vortex Pairs at Cruise Altitudes

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BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 32 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. Previous studies have usually attributed the initiation of the long-wave instability of a vortex pair to turbulence in the atmosphere or in the wake of the aircraft. The purpose here is to show by use of observations and photographs of condensation trails shed by aircraft at cruise altitudes that another initiating mechanism is not only possible but is usually the mechanism that initiates the long-wave instability at cruise altitudes. The alternate initiating mechanism comes about when engine thrust is robust enough to form an array of circumferential vortices around each jet-engine-exhaust stream. In those cases, initiation begins when the vortex sheet shed by the wing has rolled up into a vortex pair and descended to the vicinity of the inside bottom of the combined shear-layer vortex arrays. It is the in-and-out (up and down) velocity field between sequential circumferential vortices near the bottom of the array that then impresses disturbance waves on the lift-generated vortex pair that initiate the long-wave instability. A time adjustment to the Crow and Bate estimate for vortex linking is then derived for cases when thrust-based linking...



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