



Effects of Inlet Distortion on  
Aeromechanical Stability of a  
Forward-Swept High-Speed Fan

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## Effects of Inlet Distortion on Aeromechanical Stability of a Forward-Swept High-Speed Fan

By Gregory P. Herrick

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 24 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. Concerns regarding noise, propulsive efficiency, and fuel burn are inspiring aircraft designs wherein the propulsive turbomachines are partially (or fully) embedded within the airframe; such designs present serious concerns with regard to aerodynamic and aeromechanical performance of the compression system in response to inlet distortion. Separately, a forward-swept high-speed fan was developed to address noise concerns of modern podded turbofans; however this fan encounters aeroelastic instability (flutter) as it approaches stall. A three-dimensional, unsteady, Navier-Stokes computational fluid dynamics code is applied to analyze and corroborate fan performance with clean inlet flow. This code, already validated in its application to assess aerodynamic damping of vibrating blades at various flow conditions, is modified and then applied in a computational study to preliminarily assess the effects of inlet distortion on aeroelastic stability of the fan. Computational engineering application and implementation issues are discussed, followed by an investigation into the aeroelastic behavior of the fan with clean and distorted inlets. This item ships from La Vergne, TN. Paperback.



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