

Abstract Submitted
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Non-circulatory fluid forces on porous bodies with application to panel flutter ROZHIN HAJIAN, JUSTIN JAWORSKI, Lehigh University — The non-circulatory fluid forces acting on an oscillating porous panel or airfoil in uniform incompressible flow are derived from linearized potential theory. The fundamental integral equation for Holder-continuous porosity distributions is formulated and solved numerically for the special cases of non-porous and uniformly-porous panels with prescribed structural deformations. The new unsteady aerodynamic forces are then applied to aeroelastic stability predictions for porous panels or liners. Results from this analysis aim to form the basis of a complete unsteady aerodynamic theory for porous airfoils and their acoustic emissions based upon the unique attributes of natural fliers and swimmers.

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