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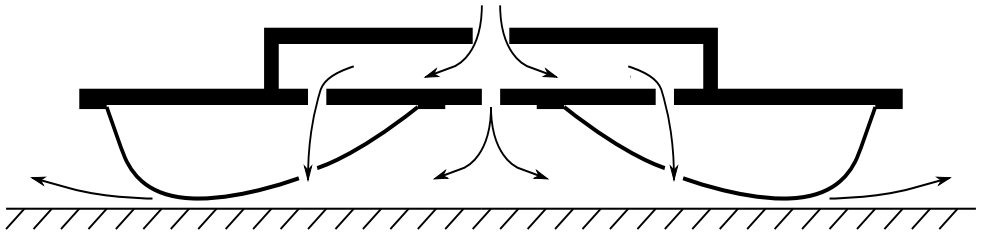
Imperial College London

Department of Aeronautics

Area of expertise

Nonlinear stability of aerostatic platforms



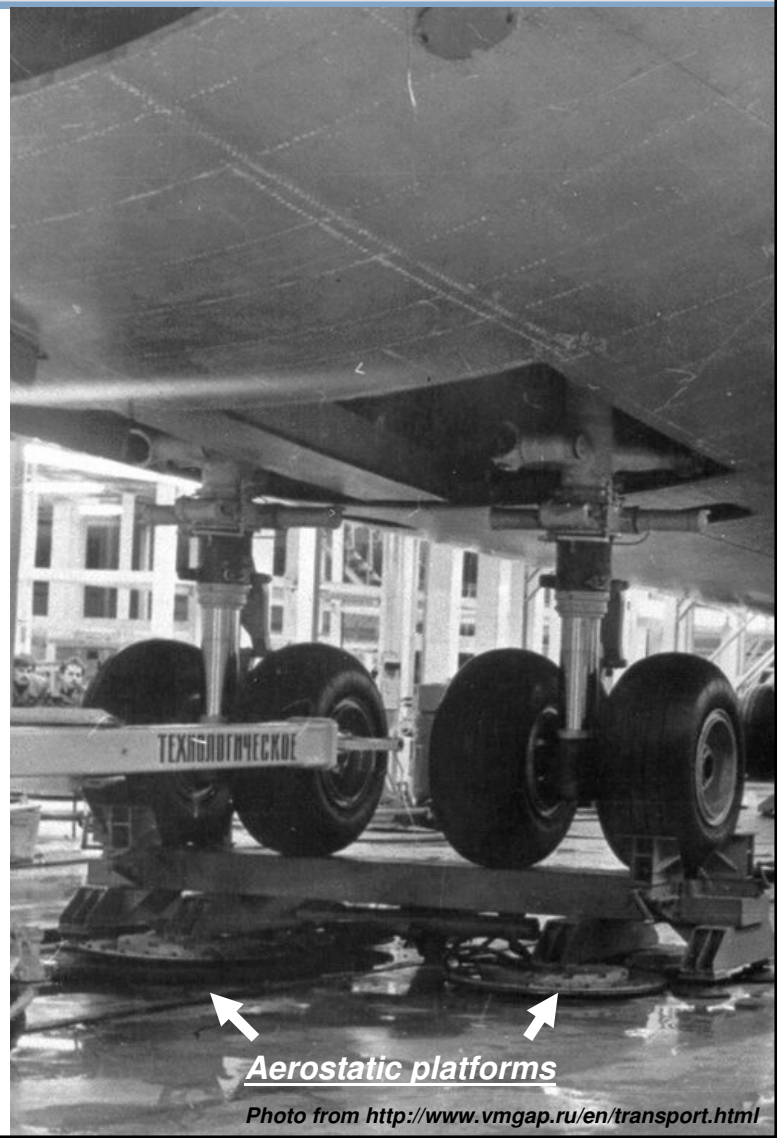
displacement

Aerostatic platforms are used to move easily (even manually) heavy loads over a short distance across a smooth surface. An aerostatic platform is a hovercraft the air cushion of which is bounded by inflatable rubber balloon so that the gap between the rubber and the floor can be as small as 0.1mm. Such a hovercraft requires very little air to fly. Under certain conditions aerostatic platforms begin to jump up and down together with the load. This instability might occur subcritically, that is in response to a finite perturbation. Within a certain class of models it turns out to be possible to reduce the problem of nonlinear stability of an aerostatic platform to the easier problem of its linear stability over a range of regimes.

force

More information:

Chernyshenko S.I. Energy criterion of auto-oscillations. Vestnik Moskovskogo Univ., Matematika & Mekhanika, 1980, No.5, 62-65. (In Russian. For the English translation see "Moscow University Mechanics Bulletin")



Aerostatic platforms

Photo from http://www.vmgap.ru/en/transport.html