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Energy harvesting of fluttering piezoelectric flags OLIVIER DOARE, UME, ENSTA-Paristech, SEBASTIEN MICHELIN, LadHyX, Ecole Polytechnique, JIAWAN CHEN, UME, ENSTA-Paristech, YIFAN XIA, LadHyX, Ecole Polytechnique — The energy harvesting from a flutter instability of a plate equipped with adjacent pairs of piezoelectric elements shunted with independent resistive circuits is considered. When the length of the piezoelectric elements is low compared to the typical wavelengths of bending deformations, governing equations are derived in the form of continuous coupled fluid-solid-electrical equations. These equations are used to perform a linear stability analysis of the coupled system, and a parametric study of the efficiency of the energy transfer from the fluid-solid system to the electrical system addressing both linear and nonlinear dynamics.

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