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Optimal wing flapping via elastic coupling MICHELE MILANO,
ROBERT SPADE, DAVID JURJEVICH, Arizona State University — We consider
a prototypical experimental setup, comprising a pitching and heaving rectangular
plate. The plate is heaving sinusoidally at constant frequency and variable ampli-
tudes, and a rotational spring generates the pitching motion passively. The rota-
tional spring is simulated by a servo motor driven by a model following controller,
and a genetic algorithm optimizes the spring parameters so as to maximize the av-
erage lift produced. We present results showing the relationship between optimal
parameters for linear and nonlinear springs, and we also investigate the effect of the
tip region flow on optimality.

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