Modelling and numerical simulations of a pendulum elastically suspended and driven by frictional contact with a rotating disk

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Abstract: The work concerns modelling and numerical simulations of a special kind of physical pendulum frictionally driven. The pendulum's joint is suspended elastically in the plane of the motion resulting in the full plane motion of the pendulum and in tree degrees of freedom of the analysed mechanical system. The pendulum is driven by frictional contact with a disk with a constant angular velocity. Examples of self-excited oscillations and bifurcation dynamics of the pendulum are presented. Majority of the work focuses on efficient approximate modelling of the resultant friction force and moment occurring on the contact surface.

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