

Numerical and experimental investigation of the Celtic stone

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A typical Celtic stone (also known as wobblestone or rattleback) is usually a semi-ellipsoidal solid (or another kind of similar rigid body with smoothly curved oblong lower surface) with a special mass distribution. The present work deals with modelling and experimental verification of a celt rotating and rolling on plane surface, where different versions of simplified model of contact forces are applied and tested. The considered contact models base on the Padé approximations and their modifications, and take into account coupled dry friction force and torque, as well as rolling resistance. The results of the work give some practical guesses of the most essential elements of contact modeling in numerical simulations of the Celtic stone.