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# Control of Random Dynamics of a Rigid Rocking Block

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The paper focuses on the controlled dynamics of a rigid block. The rocking oscillations are excited due to random horizontal ground motion. The response analysis of random rocking motion of a rigid block has been pursued for last decades; this paper considers the problem of the toppling prevention as a control problem. Assuming rigid foundation, large friction to prevent sliding, and the Newton restitution law during the impact, the only possible response mechanism under ground excitation is the rocking about the corners of the block. Control is interpreted as torque acting against the block inclination. The control task is to minimize the toppling probability with due regard to control constraints. The control problem is considered by the dynamic programming method. The equation of rocking motion corresponds to the equation of a nonlinear discontinuous oscillator. The dynamic programming equation for the stochastic discontinuous oscillatory systems is resolved asymptotically, by making use of the averaging and stochastic averaging procedures.

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