
A body collision with an obstacle

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The phenomenon of a body plane elastic collision with a rough surface (obstacle) is investigated in the context with stereomechanics model of collision (Newton model of collision). It is assumed that the body has point contact with the surface. Formulas for the collision parameters and the characteristics of the body motion after collision are depended from the type of the contact point sliding during collision. The contact point collision sliding may be stopped in the phase of deformation or in the phase of reconstruction, may be continued during throughout the collision, or may be changed during the collision. It is obtained that a type of the collision (a character of the contact point sliding during the collision is determined from the graphic picture in the plane of two parameters: the angle of friction and the hade (the angle that determined a direction of the contact point velocity before the collision). The boundaries between the regions corresponding to different types of collision are depended from the position of the collision contact point with respect the body center of mass, the body moment of inertia, the angle of friction and the coefficient of restitution.

Keywords: collision, dry friction, stereomechanics model.

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