

1023-70-1706

Florin V Badiu* (badiu@uta.edu), University of Texas at Arlington, Department of Mathematics, 411 S Nedderman Dr, Arlington, TX 76019, **Jianzhong Su** (su@uta.edu), University of Texas at Arlington, Department of Mathematics, and **Shan Hua** (hshan@uta.edu), University of Texas at Arlington, Department of Mathematics. *Rigid Body Multiple Impact With the Ground.*

This paper deals with both analytical and quantitative analysis of the impact of a rigid body with the ground. The dropping of the body is modeled and analyzed to find out the impact response as it collides with the ground. It has been observed from experimental results that the second impact for example it's more important than the first impact. This is because its magnitude is roughly two times the magnitude of the first impact.

The model is based on the linear impulse-momentum principle, the angular impulse-momentum principle for the rigid body, and some impact parameters that relates the pre- and post-impact variables, such as the coefficient of restitution, which is defined as the ratio of the post-impact relative normal velocity to the pre-impact relative normal velocity at the impact location.

The limitation of the model is such that only sliding friction can occur. We assume that there is no sticking during the impact process. When sticking does occur, the situation becomes very complex.

This mathematical analysis can further provide useful information for durability study of the impact on mobile electronic device. (Received September 26, 2006)