

Numerical Simulation of Sloshing Control Using Input Shaping

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Abstract : Effective control of sloshing in a liquid container is an important issue to be resolved in many applications. In this study, numerical simulations are performed to design the velocity profile of rectangular container and investigate the effectiveness of input shaping for sloshing control. Trapezoidal profiles of container velocity are chosen to be reference commands and they are convolved with a series of impulses to generate shaped ones that induce minimal residual oscillations. The performances of several input shapers are compared from the viewpoint of transient peak and residual oscillations of sloshing. Results show that sloshing can be effectively controlled by input shaping (Supported by the NRF programs, NRF-2015R1D1A1A01059675, of Korean government).

Keywords : input shaping, rectangular container, sloshing, trapezoidal profile

Conference Title : ICAMAME 2016 : International Conference on Aerospace, Mechanical, Automotive and Materials Engineering

Conference Location : Kyoto, Japan

Conference Dates : November 10-11, 2016