



A Computational Approach for Probabilistic Analysis of Ls-Dyna Water Impact Simulations

By Lucas G Horta

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.NASA's development of new concepts for the Crew Exploration Vehicle Orion presents many similar challenges to those worked in the sixties during the Apollo program. However, with improved modeling capabilities, new challenges arise. For example, the use of the commercial code LS-DYNA, although widely used and accepted in the technical community, often involves high-dimensional, time consuming, and computationally intensive simulations. Because of the computational cost, these tools are often used to evaluate specific conditions and rarely used for statistical analysis. The challenge is to capture what is learned from a limited number of LS-DYNA simulations to develop models that allow users to conduct interpolation of solutions at a fraction of the computational time. For this problem, response surface models are used to predict the system time responses to a water landing as a function of capsule speed, direction, attitude, water speed, and water direction. Furthermore, these models can also be used to ascertain the adequacy of the design in terms of probability measures. This paper presents a description of the LS-DYNA model, a brief summary of the...



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