

Fairing separation shock source evaluation and propagation

A. Castel, A. Trameçon

Shock resulting from separation events are one of the most challenging events to simulate. Currently, many fairing separation related design feature are resulting from a set of empirical and analytical data leading to additional required testing and potential overdesign. Simulation solutions for such event requires both an accurate simulation of non-linear event resulting from a separation event as well as a proper modeling of the shock wave propagation throughout the structure. Although mostly linear, the shock wave propagation modeling through a large and complex composite structure due to the high frequency content of the wave and the proper modeling of damping throughout the structure.

The paper presents a simulation review of a fairing separation event on a generic model. The simulation process proposes both a shock source estimation through non-linear explicit finite element simulations and a shock propagation evaluation throughout the structure. Results allow for an accurate estimation of the Shock Response Spectrum throughout the structure, which in turn is used passed down for design requirements at the component level.

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