

Visitor Research Report

Visitor Name: Mr. Alessandro Migliaccio
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Area of Research: Aerospace Structural Dynamics

Period of Visit: June 1, 2009 – August 21, 2009

Goal:

The main goals of my internship were: to learn useful subjects related to structural dynamics and the use of the software LS-DYNA. Another one was observing the organization of work at a big agency like NASA and understand the complex interrelation system between people with different fields of expertise at the workplace. I achieved those goals with a precise organization, respecting a daily routine of work on my own followed by feedback sessions with my supervisor and other colleagues.

Strategy:

The first part of my internship was focused on the theoretical study of structural dynamics and the use of LS-prepost, used for pre and post processing of data obtained from structural simulations performed with LS-dyna. During the second part I focused on the solution of a sample problem of impact to learn a practical use of the software and to perfect a soil model used by the department. The final and biggest part of my project consisted in a series of simulations related to a real structural problem: the proof that a certain structure can resist to the launch loads on his way to space.

Accomplishments:

The results of the simulations successfully showed that the structure, if adequately constrained and discretized, can easily withstand the launch loads, remaining inside the margin of safety and mass and size requirements.

From a professional point of view I acquired insights of structural dynamics and a certain experience in the use of structural simulation softwares. I benefited from my supervisor big experience and the help of well-versed engineers working at department.

Future Work:

The results of this internship work will be extremely useful for the Delfi-n3xt satellite development team at Delft University of Technology to furtherly develop a structural housing for the MPS instruments that will allow accurate measurements of radiation fluxes in space.

Seminar Presented:

At the end of my work I presented the seminar :” Design of Micro-satellite Structural Housing and Soil Impact Studies Using LS-DYNA”. It gave to the audience good insights in the structural dynamics branch work, on the technical problems I faced, the applied procedures, and the obtained results and their importance for the future development of project.