

AIMS² Research Project in Civil Engineering Program

Research Duration: Summer 2019 (June – August 2019)

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Title of Project: Sloshing Water Damper – Modeling and Simulation

Maximum number of students: 4

Project Description

The use of sloshing water damper as a passive means of reducing the vibrations has already been implemented in civil engineering community. Although the sloshing water dampers have been researched extensively the accuracy of the models and simulations is still a question. This project will focus on the application of computer software for 3D water damper models. The investigation will include the comparison of modeling techniques, the validation of the models, and the adequacy of the software.

Goals and Objectives of the Project

- (1) Introduce skills for finding and reviewing technical papers,
- (2) Introduce fundamental theory of vibrations and modeling techniques,
- (3) Learn and use ANSYS (the software for simulations), and
- (4) Use computer simulations to investigate and understand the sloshing liquid.

Expectations

Student research assistants are expected to:

- Attend weekly meetings and to work 12 to 16 hours per week,
- Have computer aided graphic skill,
- Present their work in the AIMS² Research Symposium (early Fall 2019, TBA), and
- Be willing to learn while learning and think deeply about this project.

Outcomes

Through this project students will:

- (1) Develop research skills such as an ability to develop and refine good questions to get needed information,
- (2) Be engaged to engineering problem-solving steps from the issue discovery, problem identification (convert to a solvable engineering and science project), solution plans, implementation, analysis and interpretation, and
- (3) Enhance their presentation skills (i.e., create a poster, prepare Power Point slides, present orally).