

Dynamic modeling of riggings of complex geometry loads

M. López Lago, J. Collazo Rodríguez, J.A. Vilán Vilán, A. Segade Robleda

Department of Mechanical Engineering, University of Vigo

mllago@uvigo.es, joaquincollazo@uvigo.es, jvilan@uvigo.es, asegade@uvigo.es

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The movement of loads is of key importance in heavy industry. Large pieces with complex geometries are moved every day in industries as shipbuilding, wind turbine mounting or great civil works. Furthermore, there are some adverse conditions such as the wind effects that obstruct these operations.

Cranes are usually employed for the lift processes and the load is linked with it by a sling system called rigging. The rigging is commonly formed by flexible elements and connections, such as wire rope or textile slings and shackles.

A multiphysics dynamical model to represent the behavior of the load and rigging in the lifting process is presented in this work. The influence of external actions is taken into account in the definition and resolution of this dynamical system that will be solved as a multibody system combined with fluid-solid interactions using CFD techniques.

The behavior of the load and rigging is predicted with sufficient approximation thanks to the multiphysics model proposed. Possible instabilities or irregularities can be detected and this could help in the design of the lift system and in its optimization.