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Rapid Design Iteration Process for Spacecraft Kinematic Mounts Using Automatic Tet Meshing and Global/Local Modeling Techniques

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Spacecraft kinematic mounts have been successfully developed at TRW Space & Electronics to support instruments on the Aqua and Aura spacecrafts. Kinematic mounts are flexures, which allow differential strains to develop between the spacecraft structure and the instruments without inducing significant load into the instruments.

The kinematic mount designers and analysts are faced with the challenge of making multiple design iterations in a short amount of time. To meet this challenge, a rapid design iteration process has been developed using MSC.Patran and MSC.Nastran. This paper presents this rapid design iteration process. In particular, the direct import of CAD solid geometry, the extensive use of automatic tet meshing, and the application of global/local modeling techniques are presented.