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16. Applications

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Rotative Actuators Robustness

A special group of rotative actuators used in space mechanisms like antenna pointing devices or RF switches, described by some singularly perturbed system of equations, are very susceptible to uncertainties of system parameters. The paper deals with two problems: 1. First defines a parameter L, that may change the number of equilibrium points of the system and derives a robustness criteria for variations in L. 2. Second establishes some stability margins in the case of some structured-type parameter uncertainties likely to occur due to temperature fluctuations and age. The method is compared with the traditional approach of estimating the design robustness via torque margins - MIL-A-83577B "General Specification for Moving Mechanical Assemblies, for Space and Launch Vehicles". Some numerical examples are presented.