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Applications of Group Theory to the Linear Stability Analysis of Relative Equilibria

The theory of representations of finite groups has been successfully applied to solve problems in Chemistry and Physics where symmetries are present. A particularly interesting application involves symmetric equilibria, i.e, equilibria possessing a nontrivial group of symmetries, and equivariant linear mappings arising from a physical problem where such symmetric equilibria appear. We present an overview of the theory followed by applications to the stability problem of relative equilibria in Celestial Mechanics.