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Effect of Robot Configuration Parameters, Masses and Friction on Painlevé Paradox for a Sliding Two-Link (P-R) Robot

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Abstract : For a rigid body sliding on a rough surface, a range of uncertainty or non-uniqueness of solution could be found, which is termed: Painlevé paradox. Painlevé paradox is the reason of a wide range of bouncing motion, observed during sliding of robotic manipulators on rough surfaces. In this research work, the existence of the paradox zone during the sliding motion of a two-link (P-R) robotic manipulator with a unilateral constraint is investigated. Parametric study is performed to investigate the effect of friction, link-length ratio, total height and link-mass ratio on the paradox zone.

Keywords : dynamical system, friction, multibody system, painlevé paradox, robotic systems, sliding robots, unilateral constraint
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