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MODELING OF ROLLING AND SLIDING FRICTION OF SPHERICAL RIGID BODIES

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Abstract. This work investigates the dynamic motion of spherical rigid bodies which are subject to the effects of rolling and sliding friction. In this work, a spherical body is modelled as a rigid body with translational and rotational degrees of freedom, which allows to properly describe any general motion. The associated frictional contact problem is solved with a mixed dual formulation based on an augmented Lagrangian technique, whereas the equations of motion are integrated using the nonsmooth generalized-alpha scheme. In order to assess the numerical performance of the proposed methodology, the motion of two spheres over a plane is studied, where the impact between the two spheres is additionally considered.

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