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Title: On variational formulations with rigid-body constraints for finite elasticity: Applications to 2D and 3D finite element simulations

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**Highlights**

- Present a variational formulation with rigid-body constraints for finite elasticity
- The 3D FEM of the variational formulation with rigid-body constraints is proposed
- The framework is applied to displacement-based and mixed FE with arbitrary order
- Present an application in 2D where the rigid inclusion has highly graded edges
- Present an application in 3D with complex spatial distribution of rigid inclusions

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