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**Effects of large deformation and material
nonlinearity on spherical indentation of
hyperelastic soft materials**

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Highlights

The application of the Hertz model for hyperelastic indentation was clarified.

The spherical indentation behaviors of hyperelastic soft solids mainly depend on the coupling interactions of large deformation and material nonlinearity.

Two nonlinear contact models for incompressible linear elastic materials undergoing large deformation and hyperelastic soft materials were proposed and verified, respectively.

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