

## **A Nonlinear Frictional Contact Model for Spherical Particles**

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### **CE DATABASE SUBJECT HEADINGS**

Granular Materials; Particle interactions; Friction; Nonlinear analysis; Impact forces; Finite elements

**Abstract:** The researchers developed an efficient numerical model describing nonlinear translation and rotation frictional contact forces between two spheres. Several sets of solid linear brick finite element models examined nonlinear contact behavior, providing a basis for the numerical friction contact model. The finite element contact models ranged from constrained pseudo-static displacements to unconstrained dynamic models. The behavior and parameters of the numerical model were derived from the pseudo-static models; the parameters were refined based on the constrained dynamic finite element models. The unconstrained finite element model validated the frictional contact numerical model. The frictional contact numerical model provides efficiency needed for multi-element contact models, while increasing the accuracy of the nonlinear response compared to existing bilinear contact models.

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