

## 基于超圆颗粒模型的二维离散元法计算方法

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### 摘要

采用超圆方程建立复杂形状颗粒的二维离散元法分析模型, 提出采用外接矩形进行初步的接触检测, 采用牛顿下山法进行精确的接触检测、接触点求解和接触叠合量的计算, 建立了基于超圆方程的颗粒二维离散元法计算方法。实例验证证明了所建立方法的正确性和有效性, 为复杂形状颗粒运动的离散元法仿真分析提供了一种可行的方法。

关键词 [计算机软件](#); [离散元法](#) [超圆方程](#) [碰撞检测](#) [颗粒材料](#)

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## 2D DEM calculation methods based on superquadratics particles modeling

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### Abstract

In the analysis of contact action between particles and correlative machine components by Discrete Element Method (DEM), a key issue that influences the analysis precision and efficiency is how to build the DEM model of the particles with complicated shapes. In this paper, the superquadratics equation is employed to build the 2D DEM analysis models of complicated particles. A method using exterior rectangles for preliminary contact inspection is proposed. The accurate contact inspection, contact point solution and contact overlapping calculation are carried out using Newton downhill method. The effectiveness and feasibility of the proposed method are verified by numerical simulation, which is viable to analyze and resolve the movement of complicated particles.

**Key words** [computer software](#) [DEM](#) [superquadratics equation](#) [detecting of contact](#) [granular material](#)

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