Abstract

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Why prediction of grain behavior is difficult for geological granular systems

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Despite much progress in recent years in our understanding of the physics of granular materials, little of this progress has been translated into an improved understanding of processes in the geological sciences, and less still into our ability to make predictions of the future trajectory of geologic systems. One possible reason is that geologists do not know enough physics to make the applications that otherwise could have been made. Or, it may be that geological granular systems are intrinsically more resistant to the scientific approaches and methods used successfully in analyzing the physics of granular material at the laboratory scale. I will argue that the latter is an important part of the story, if not the whole story, of why prediction and understanding, but especially prediction, in geology and other environmental sciences, have not profited greatly from our developing understanding of the physics of granular materials.