- **Article:** Jamming is not just cool anymore
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1 Backgroud

To describe the jamming phenomena in daily life, Cates et al. suggest a new kinds of materials:"fragile matter". Similar to solid phase of normal materials, the systems are driven to a jammed state by the external stress. However, the fundamental difference between them is a minor change of the direction of the external force on "fragile matters" may lead to the breaking up the jammed state. The sand piles are a good example of this.

Traditionally, elastoplasti theories, which are similar to theories used to describe normal solid, could be used to describe the behavior of sand piles. Cates abandons those ideas by discussing a pile of non-deformable particles. This could be consider as an extreme case where the strain is no longer an important variable.

Also, he propose that we can take a compromise that allow particles to respond elastically under a relatively small load. After all, in real situation, all particles will deform when a stress is added on it. But Cates's "inelastic model" still provides us an new point of view for us to understand the jammed materails.

2 What is new

Being inspired by Cates work, the authors suggest the following possibilities:

- Rather than only considering the repulsive interactions, we could consider use the attractive interactions to replace the external stress. This idea is based on the fact that previous study has already showed that in liquids and glasses we attractive interactions behave the same as those systems with the repulsive interaction but are constrained in a container.
- We can try to consider the thermal fluctuation of the system. That means we can try to find an effective temperature to describe the behavior of system.
- We can get a phase digram of the system, which could tells us the dependence of the state(jammed or unjammed) on the its density, temperature and the external stress.
- Also, it is also interesting to ask whether the dynamics of others system like granular materials are driven by the same factors(temperature etc.).