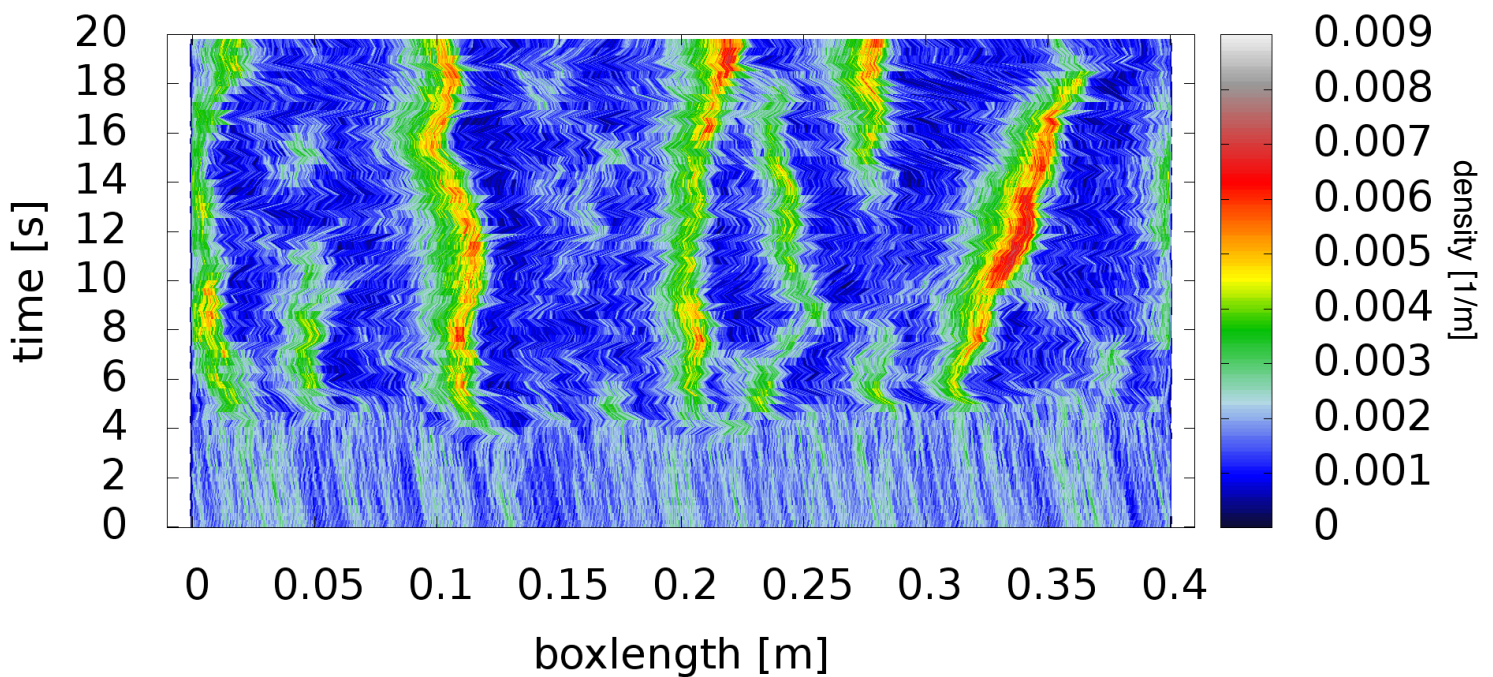


Pattern Formation in a Horizontally Vibrated Granular Submonolayer

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Past experiments with a horizontally vibrated submonolayer have shown that the particles will arrange themselves in stripes perpendicular to the driving direction. To understand this behavior Strassburger et al. developed a model in form of a cellular automaton: During one excitation all particles simultaneously jump in the direction of excitation until they are stopped by a neighboring particle. Conducting laboratory experiments the stripe formation can be reproduced but here the particles don't seem to jump. Longtime experiments also showed that the number of stripes will decrease over time and in the end they will lose their structure to form a single cluster of particles. We now model this system in a force-based molecular dynamics simulation and show that the particles might jump but that this is not essential for the stripe formation. It is rather based on the friction between the particles, since particles in contact are kept from rolling freely and therefore are dragged along by the oscillating floor.

