2011 Special Program: Two-Phase Flow, Interface Flow and Related Phenomena

Continuum modeling of a discrete medium: the case of compartmentalized granular gases

2011 - 09 - 28 (Wed.)
15:00 - 17:00
101, Mathematics Research Center Building (ori. New Math. Bldg.)

Searching for the discrete-continuous correspondence is one of the interesting and important matters in the realm of multiscale physics. A granular material, an aggregate of a large number of discrete solid grains, could be a paradigm for the modeling of a discrete system as a continuous medium. The simplest granular system might be granular gases due to the fact that the only interaction between granular particles comes from collisions. However, their characteristic feature, showing the tendency to spontaneously separate in dense and dilute regions, makes them fundamentally different from any other ordinary molecular gases.

Here address two examples, focusing on the continuous treatment for the motion of a compartmentalized granular gas. First, we solve the temperature in the Egger's flux model to interpret the change in the condensation temperature when one intruder is added into a compartmentalized monodisperse granular gas. Second, the Egger's flux function is modified to characterize the behavior of two-types of oscillation in unequally compartmentalized granular gases.