DEM simulations of shear flow of spherical particles mixed with long granular rods
OLEH BARAN, CD-adapco — Using Discrete Element Method (DEM) I investigate the effect of adding rigid rod-shape particles to the granular flow of spherical particles inside ring shear tester. The simulated geometry includes an annulus, bounded by two concentric cylindrical walls rested on a stationary bottom disk and covered with a top lid. Both the top lid and the bottom have protruding vanes oriented radially and uniformly spaced around the annulus, to prevent slipping of the bulk solid, see image at this link. The top lid rotates with a controlled angular speed and applies a constant normal load to the tested material. I analyze the results for shear stress on the top lid as a function of time for the mixture of spheres and rods and compare these results with ones obtained for the same amount of spherical particles without rods. I also present the analysis of the orientation of granular rods in a shear flow and discuss the results in terms of new time-scale related to the mobility of rods.