

DEM+
Code

Calculation of
global forces and
global torques
Acting on particles.

$$\mathbf{F} = \sum_{i=1}^n f_i \Delta V_i$$
$$\mathbf{L} = \sum_{i=1}^n r_i f_i \Delta V_i$$

CFD
Code

Particles velocity, their
position with respect to grid.

$$\frac{\partial \rho \mathbf{u}_i}{\partial t} = RHS - \underbrace{\frac{\chi}{\eta} \rho (\mathbf{u}_i - \mathbf{U}^o)^2}_{f_i}$$