Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Motion of Non-Axisymmetric Particles in a Simple Shear Flow
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— The motion of rigid particles of complex shapes is studied in this work using a new closure model. Each particle is non axisymmetric and its orientation is described with a second order tensor. The geometry such particles (e.g. ellipsoids) and their interactions with the surrounding fluid are described by a third order tensor instead of the single parameter often used for axisymmetric particles (spheroids). The flow-induced alignment of these particles can be computed by solving an evolution equation for the orientation distribution function but such computations are costly. Instead, an evolution equation for the second moment of the distribution function, which forms a fourth order tensor, is solved in order to obtain the average orientation of the particles in homogeneous flows. A closure model is introduced in this work and its performance is studied for a prescribed simple shear flow.

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Date submitted: 15 Aug 2005 Electronic form version 1.4