Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Symmetric pair of elongated particles settling at low Reynolds number regime MAREK BUKOWICKI, MARIA EKIEL-JEZEWSKA, Institute of Fundamental Technological Research, Polish Academy of Sciences — Numerical results for dynamics of rigid and semi-flexible filaments settling down at low Reynolds number regime will be presented. Particles are assumed to be large enough to not experience significant influence of Brownian forces. For modelling, bead model and RotnePragerYamakawa approximation are used. Initial position of filaments is symmetric, with vertical symmetry plane. Due to this symmetry of the system, obtained results are valid also for a single particle, dragged by a force parallel to a plain surface of the fluid (by correspondence with method of images for forces near free surface). It was reported before that rigid filaments, placed initially in a vertical plane, tumble periodically. Here we generalize these results for all symmetric configurations and in this way extend known class of periodic solutions. When filaments are flexible, richer behaviour is found: initially particles oscillate, yet oscillations are dumped with time, leading to non-oscillating motion where filaments approach each other.

Marek Bukowicki
Polish Academy of Sciences

Date submitted: 12 Sep 2017 Electronic form version 1.4