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Effect of the History Force on Particle Trajectories within an Oscillatory Rotating Flow SHUJING XU, ALI NADIM, Claremont Graduate University — At a previous APS-DFD meeting it was reported, based on theoretical considerations, that particles denser than their suspending fluid can be made to migrate *toward* the rotation axis if the container undergoes oscillatory rigid-body rotation in an appropriate range of frequencies [Nadim et al., *Bull. Am. Phys. Soc.*, **53**, 191 (2008)]. This is contrary to ordinary centrifugation. However, the effect of the Basset history force was not accounted for in that analysis. It is shown here that while the history force significantly affects the dynamics of the particles, the oscillatory "counter-centrifugation" effect that was previously discovered continues to persist even when the history force is included in the analysis. Interestingly, inclusion of the history force can extend the parameter regime for which oscillatory counter-centrifugation might be observed.

Ali Nadim
Claremont Graduate University

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