

ON SOME MOTIONS OF SECOND GRADE FLUIDS INDUCED BY A SPHERE THAT APPLIES OSCILLATING SHEAR STRESSES TO THE FLUID

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Abstract. *Exact solutions for the laminar basic flow of second grade fluids due to a sphere that applies oscillating shear stresses to the fluid are presented as a sum of permanent and transient solutions. The corresponding solutions for Newtonian fluids, as expected, are obtained as limiting cases of general solutions and the required time to reach the steady-state is graphically determined. This time is very small for both type of oscillating motions. Consequently, the steady-state or permanent solutions corresponding to such motions are most important.*

Keywords: *Exact solutions; Oscillating shear stresses on a sphere; Second grade fluids.*

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