

Dedicated to Professor LAZĂR DRAGOȘ on his 75th birthday

Some exact solutions for the motion of a second grade fluid due to an oscillating sphere

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Abstract - The exact solutions corresponding to the primary motion of a second grade fluid caused by the sine and cosine rotational oscillations of a sphere are presented in terms of modified Bessel functions $I_{3/2}(\cdot)$ and $K_{3/2}(\cdot)$. The similar solutions within an oscillating sphere are obtained as a limiting case. Finally, the starting solutions for the motion in an oscillating sphere are also determined. For $\alpha_1 \rightarrow 0$ all solutions tend to those for a Newtonian fluid.

Key words and phrases : second grade fluid, steady-state solution, oscillating sphere.

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