

Abstract Submitted
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Dynamical behavior of electrorheological suspensions. SUCHANDRA DAS, New Jersey Institute of Technology, SRIRAM PILLAPAKKAM, Temple University, NAGA MUSUNURI, Indiana Tech, ISLAM BENOUGUEF, New Jersey Institute of Technology, EDISON AMAH, Intel Corporation, IAN FISCHER, PUSHPENDRA SINGH, New Jersey Institute of Technology — Electrorheological suspensions are formed by suspending dielectric solid particles in a dielectric liquid. The size of the particles varies between nano and micro meters, depending on the requirements of the intended application. When an electric field is applied, the particles become polarized and form chains and columns which align in the direction of the field, and this increases the viscosity of the electrorheological suspension. This change in the suspension microstructure and viscosity happens within a few milliseconds after the electric field is applied, and when the electric field is removed the viscosity goes back to the original value, which makes the suspension suitable for the applications where a quick response time is desired. The aim of this work is to employ the experimental and direct numerical simulation techniques to study the electrorheological response and the role of parameters such as the particle size and polarizabilities in the process.

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