1005-76-210   **Andrew Belmonte***, W. G. Pritchard Laboratories, Department of Mathematics, Penn State University, **J. R. Gladden**, W. G. Pritchard Laboratories, Department of Mathematics, Penn State University, and **Benjamin Akers**, W. G. Pritchard Laboratories, Department of Mathematics, Penn State University. *Impact of a solid into a viscoelastic micellar fluid.*

We present an experimental study of the impact of a solid sphere on the free surface of a viscoelastic wormlike micellar fluid. Spheres of various sizes and densities are dropped from different heights above the fluid surface, below which transient oscillations are observed. It is well known that entry of a solid into a Newtonian fluid is characterized by the Froude number; our measurements of sphere penetration scale with the ratio of kinetic energy to the elastic modulus of the fluid. The cavity formed by the sphere also undergoes transitions from smooth to fractured surface texture, dependent on both the Deborah number and the ratio of gravitational force to elasticity. We discuss analogies between this system and impact in granular materials. (Received February 14, 2005)