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Fluorescent probes for shock compression spectroscopy ALEXANDR BANISHEV, JAMES CHRISTENSEN, DANA DLOTT, University of Illinois at Urbana-Champaign — We have demonstrated the capability of using Rhodamine 6G dye as an ultrafast emission probe in high-speed shock compression of condensed matter. The ultimate time response of the probe, which functions as a high-speed pressure sensor, is limited by fundamental photophysical processes such as radiative rates, internal conversion rates and intersystem crossing rates. The time response has been greatly improved by encapsulating the dye in silica nano or microparticles. This probe was used to observed nanosecond viscoelastic shock compression of a polymer (PMMA), and has been used to monitor the response of individual grains of sand to high-speed impact.

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