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Shock compression spectroscopy with high time and space resolution

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Shock compression of molecules with high time and space resolution is obtained using a combination of femtosecond laser-driven shock waves and coherent nonlinear vibrational spectroscopy. In a molecular monolayer, vibrational spectroscopy is used to look at a single atomic group, CH_3, as the < 3 ps rise time shock front passes. Through comparison with molecular simulations, the detailed nature of shock-induced molecular deformations is determined.