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Velocity map imaging as a tool for recovering mechanistic information from adaptive strong-field coherent control[1] E. WELLS, R. AVERIN, B. JOCHIM, Department of Physics, Augustana College, Sioux Falls, SD 57197 USA, J. MCKENNA, S. DE, D. RAY, M. ZOHRABI, K.D. CARNES, J.R. Macdonald Laboratory, Kansas State University, Manhattan, KS 66506 USA, M.F. KLING, J.R. Macdonald Laboratory, Kansas State University, Manhattan, KS 66506 USA and Max Planck Institue of Quantum Optics, Garching, Germany, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Kansas State University, Manhattan, KS 66506 USA — Adaptive control schemes which couple experimental feedback to a genetic algorithm to identify an optimally-shaped ultrafast laser pulse have become popular, but often it is difficult to recover information about the control mechanism. As we demonstrate with CO, the incorporation of velocity map imaging into the control loop allows simultaneous optimization of the dissociation angle and fragmentation branching ratio. Moreover, the kinetic energy release information obtained from the image produced by the optimal pulse, when combined with knowledge of the ionic potential energy curves, yields clues about the dissociation mechanism.

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