

Abstract Submitted
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Deciphering optimal control fields GUAN-YEU CHEN, WENDELL T. HILL, III, University of Maryland — Pulse shaping coupled with adaptive feedback (genetic algorithm, GA) provides an experimental knob to control dynamics not readily available by other means. The optimal fields, however, are generally unintelligible. To address this problem, we chose to control a well-defined mode - bending - in a relatively simple triatomic system, CO₂ with a strong field. We have shown that the control pulse can be deciphered by comparing GA searches performed with radically different parameter sets. Specifically we first controlled the bending by running a GA search with a reduced parameter set, restricting the solutions to features that were straightforward to associate with the dynamics. We then repeated the search with an unrestricted parameter set and compared the two solutions. Both searches showed enhancement and the similarities were remarkable and enabled us to identify the dynamics responsible for the control. These results will be discussed in term of general applicability to strong-field adaptive control.

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