

Abstract Submitted  
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**Applying Principle Control Analysis to Optical Pulse  
Shapes Optimized for Selective Fragmentation of Clusters<sup>1</sup>** K.

J. BETSCH, E. WELLS, Department of Physics, Augustana College,  
Sioux Falls, SD 57197 — Principal control analysis has been applied to  
the results of a learning algorithm search that optimized optical pulse  
shapes for selective fragmentation of  $S_8$  clusters. This technique reduces  
the control dimensions needed for pulse shape optimization for this mul-  
tiphoton process. Pulse shapes optimized for ionization/fragmentation  
generally require more control directions than the stimulated Raman  
scattering processes explored by White *et al*<sup>2</sup>. Thus, despite using  
principal control analysis, it still appears difficult to extract informa-  
tion about the quantum dynamics of higher order processes from the  
optimized pulse shape.

<sup>1</sup>Data obtained in collaboration with C.W.S. Conover and R.R. Jones  
at the University of Virginia.

<sup>2</sup>J. L. White, B. J. Pearson, and P. H. Bucksbaum, J. Phys. B **37**, L399  
(2004).

Prefer Oral Session  
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