

Abstract Submitted  
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**Large amplitude local-bending eigenstates in the SEP spectrum of acetylene** ADAM STEEVES, JOSH BARABAN, ROBERT FIELD, MIT — The bending dynamics of acetylene undergo a normal-to-local transition in the vicinity of twelve quanta of excitation. We report the observation, by stimulated emission pumping, of the first few eigenstates exhibiting local-mode behavior. Assignments are made on the basis of complementary information in spectra recorded from intermediate levels with *gerade* and *ungerade* vibrational symmetry. The highest energy state currently assigned ( $N_{\text{bend}} = 16$ ) is characterized by a large ( $> 75^\circ$ ) distortion from the linear geometry at its classical turning point. Large geometrical distortions will lead to unique electronic, collisional, and chemical properties for these eigenstates.

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