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Orientation of “asymmetric-top” water molecules with shaped terahertz fields CATHERINE HERNE, University of Michigan, PHILIP BUCKSBAUM, Stanford University — We demonstrate orientation of the asymmetric top water molecule with a programmable series of half-cycle terahertz pulses. Molecular orientation or alignment controls initial conditions and reduces random spatial orientations of molecules, and is essential for efficient generation of high-order harmonics and many other processes. Our experimental evidence confirms what has until now only been theoretically considered; the orientation of asymmetric tops. The application of a sequence of broadband half-cycle pulses to an ensemble of water molecules in the gas phase initiates a sequence of orientation revivals. Two parallel pulses with optimal pulse separation are shown to enhance the degree of orientation and restrict motion about the most polarizable molecular axes.

Prefer Oral Session
 Prefer Poster Session

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