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Using the angular dependence of a quantizing magnetic field to probe the Bloch states in room temperature superlattice devices. ROSS MCDONALD, Los Alamos National Lab., SHIGEKI KOBAYASHI, S. JIM ALLEN , UCSB, SUSAN COX, JOHN SINGLETON, LANL — The prospect of designing Bloch-oscillator superlattice structures that operate at room temperature has both intrigued and eluded the scientific community since its conception over 35 years ago. Advances in band structure architecture and engineering continuously address this issue, improving the fabrication of devices designed to operate as room temperature THz frequency oscillators. Here we report room-temperature pulsed-IV measurements in tilted magnetic fields of up to 30 Tesla, designed to probe the coherence of superlattice Bloch states. Biasing these devices beyond Ohmic conduction reveals differential conductance features with a $1/\cos(\theta)$ dependence upon the field angle. The voltages at which these features occur is determined by the condition that the ratio of the Bloch to cyclotron frequencies be an integer. This behavior is consistent with resonant de-localization of Bloch oscillations due to nonlinear coupling to the cyclotron motion in tipped field.

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