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【117】 Terahertz Intersubband Electroluminescence from Nonpolar m-Plane ZnO Quantum Cascade Structures

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The large ZnO LO-phonon energy reduces the thermally activated LO-phonon scattering, showing great potential for improving the temperature performance of THz quantum cascade lasers. Here, we report the observation of THz intersubband electroluminescence from ZnO/MgxZn1-xO quantum cascade structures grown on a nonpolar m-plane ZnO substrate up to room temperature. The electroluminescence spectrum shows a line width of ~20 meV at a center frequency of ~8.5 THz at 110 K, which is not accessible for GaAs-based quantum cascade structures because of the reststrahlen band absorption. This result demonstrates an important step toward the realization of ZnO-based THz quantum cascade lasers.

Authors: MENG, Bo (ETH Zurich); HINKOV, Borislav; MARIE L. BIAVAN, Nolwenn (ETH); T. HOANG, Hanh (TU-Wien); LEFEBVRE, Denis (CNRS, CRHEA); HUGUES, Maxime (CNRS, CRHEA); STARK, David (ETH); FRANCKIÉ, Martin (ETH); TORRES-PARDO, Almudena (Universidad Complutense de Madrid); TAMAYO-ARRIOLA, Julien (Universidad Politécnica de Madrid); M. BAJO, Miguel (Universidad Politécnica de Madrid); HIERRO, Adrian (Universidad Politécnica de Madrid); STRASSER, Gottfried (TU Wien); FAIST, Jérôme (ETH Zurich); M. CHAUVEAU, Jean (GEMAC Université Versailles Saint Quentin)

Presenter: FRANCKIÉ, Martin (ETH)

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