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【115】 Interband cascade lasers: beating intersubband transitions

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We present our recent results on the impact of intersubband absorption in the valence band on the performance of interband cascade lasers (ICLs). We observe a clear performance dependence on the thickness and composition of the $\text{Ga}_{1-x}\text{In}_x\text{Sb}$ hole-quantum well (QW), reflecting in the characteristic temperature T_0 as well as the threshold current density J_{th} . By careful design of the active W-QW the intersubband absorption in the valence band can be tailored and even completely avoided, allowing us to enhance ICL performance outside of the sweet spot 3-4 μm region, paving the way towards higher cw operating temperatures and output powers.

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