285. Title:Gain enhancement in a terahertz quantum cascade laser with parylene antireflection coatings

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Abstract:We study the effect of parylene antireflection coatings on the gain of a 2.8 THz quantum cascade laser using terahertz time-domain spectroscopy. With antireflection coatings the threshold current increases as the mirror losses are increased, and the gain clamps at 16 cm-1, compared to 10 cm -1 for an uncoated device. These values are consistent with a drop in reflectivity from 0.320 to 0.053 as a consequence of the coating deposition. Further improvements could reveal the bare cavity gain and permit the quantum cascade laser to be used as an efficient terahertz amplifier.