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Abstract:We report on an extensive experimental study of intersubband excitations in the THz range arising from the coupling between a quantum well and a zero-dimensional metal-metal microcavity. Because of the conceptual simplicity of the resonators, we obtain an extremely predictable and controllable system to investigate light-matter interaction. The experimental data are modeled by combining a quantum mechanical approach with an effective medium electromagnetic simulation that allows us to take into account the losses of the system. By comparing our modeling with the data, we are able to retrieve microscopic information, such as the electronic populations on different subbands as a function of the temperature. Our modeling approach sets the base of a designer tool for intersubband light-matter coupled systems.
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