372. Title:Heating and cooling of a two-dimensional electron gas by terahertz radiation
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Abstract:The absorption of terahertz radiation by free charge carriers in n-type semiconductor quantum wells accompanied by the interaction of electrons with acoustic and optical phonons is studied. It is shown that intrasubband optical transitions can cause both heating and cooling of the electron gas. The cooling of charge carriers occurs in a certain temperature and radiation frequency region where light is most efficiently absorbed due to intrasubband transitions with emission of optical phonons. In GaAs quantum wells, the optical cooling of electrons occurs most efficiently at liquid nitrogen temperatures, while cooling is possible even at room temperature in GaN heterostructures.