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Optical conductivity in strongly correlated electron materials[1]
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optical phenomena are of fundamental importance in the investigation of electronic
structures of strongly correlated electron materials [1]. Starting from the Hamilto-
nian of a correlated electron material exposed to a time-dependent laser field, we
formulate the particle current density. Within a mean-field approximation, we ex-
press the current density in terms of the expectation values of quasiparticle density
operators by performing the canonical transformation. Within the Heisenberg pic-
ture, we solve a set of equations of motion for these quasiparticle densities. Finally
we calculate the optical conductivity in several typical systems. [1] R. D. Averitt
and A. J. Taylor, J. Phys: Condensed Matter 14, R1357 (2002).

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