

# Single- and many-body physics of slow-light and stationary-light polaritons

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When light interacts with coherently driven three-level quantum systems under conditions of electromagnetically induced transparency (EIT), composite particles, called dark-state polaritons (DSP) are formed which behave as massive objects with variable mass. They are the basis of slow, stored and stationary light. I will introduce the concept of dark-state polaritons and explain how to create scalar and gauge potentials (effective magnetic fields) and remark on generalizations to multi-component polaritons which behave as Dirac particles. When confined to 1D with particle-particle interaction, polaritons can fermionize. The dynamics of this process has some interesting similarities to the thermalization of the integrable Lieb-Liniger gas.