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Polaritonics in view

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Abstract

A primary limitation of the intensively researched polaritonic systems compared to their atomic counterparts for the study of strongly correlated phenomena and many-body physics is their relatively weak two-particle interactions compared to disorder. In this presentation, we will show how new opportunities to enhance such on-site interactions and nonlinearities arise by tuning the exciton-polariton dipole moment in electrically biased semiconductor microcavities incorporating wide quantum wells. The applied field results in a twofold enhancement of exciton-exciton interactions as well as more efficiently driving relaxation towards low energy polariton states, thus, reducing condensation threshold.