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Few-electron physics in single- and double quantum dots in carbon nanotubes BERNHARD WUNSCH, Physics Department, Harvard University, JAVIER VON STECHER, ANA MARIA REY, JILA, University of Colorado and NIST, EUGENE DEMLER, Physics Department, Harvard University — We study the few-electron eigenspectrum of single- and double quantum dots in carbon-nanotubes. The interplay between spin-orbit coupling and electron-electron interaction strongly modifies the two-particle spectrum. In particular, we find a transition to a spin- and valley polarized ground state at small magnetic fields even for a single quantum dot. We discuss manifestations of this break-down of the constant interaction model in the transport characteristics of double dots, and analyze when Pauli-blockade of the current can occur.

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