

Switching currents through molecules

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We investigate the zero-bias and zero-temperature conductance through π -conjugated annulene molecules weakly coupled to two leads for different source-drain configurations. We find an important reduction in the current for certain transmission channels and for particular geometries as a consequence of destructive quantum interference between states with definite momenta. An abrupt increase of the conductance occurs when translational symmetry is broken by an external perturbation, thus leading to the possibility of a large switching of the conductance through single molecules.