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Quantum Wire Fano Resonance in an Electric Field V. VARGIAMIDIS, Aristotle University, Thessaloniki, Greece, V. FESSATIDIS, Fordham University, Bronx, USA, N.J.M. HORING, Stevens Institute of Technology, Hoboken, USA — Electronic transport through a straight parabolically confined quantum wire with an attractive impurity and a transverse electric field is investigated via the Feshbach coupled-channel theory. The impurity is modeled by a δ-function potential in the propagation direction while it is Gaussian in the transverse direction. In the presence of an impurity, the transmission probability of the wire may exhibit resonances of the Fano type (which is the result of the interference between background transmission and transmission via a quasibound state created in the impurity). It is shown here that increasing the field strength from zero causes displacement of the confining potential, thereby inducing a "shifting" of the impurity across the channel and therefore influencing the resonance structure. As the center of the confining potential approaches the center of the impurity, the coupling of the (first) propagating state with the quasibound state of the second channel gradually decreases, resulting in a decrease of the resonance width. For a particular value of the field strength the resonance width shrinks to zero and the Fano profile collapses. The resonance energy is also examined as a function of the electric field strength.

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