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Effects of intrasubband coupling on the scattering phases and density of states in a quantum wire VASSILIOS VARGIAMIDIS, Aristotle University, Thessaloniki, Greece, VASSILIOS FESSATIDIS, Fordham University, Bronx, USA, PH. KOMNINOU, Aristotle University, Thessaloniki, Greece — The properties of scattering phases and density of states in a quantum wire with an attractive scatterer are analyzed. We consider two bound states, belonging to different subbands, which couple to a scattering channel and give rise to two Fano resonances. It is shown that varying the parameters of the scatterer (such as its strength and position) produces significantly different effects on the phase behavior and density of states, depending on the subband they occur. These effects stem mainly from the difference between the coupling matrix elements of the two resonant levels with the propagating channel mode. As a consequence, the phase evolution in one subband may exhibit opposite behavior from the phase evolution in another subband. These findings may prove experimentally useful in ballistic transport through narrow channels.

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