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Density of states and scattering matrix in quasi-one-dimensional systems VASSILIOS VARGIAMIDIS, Aristotle University, Thessaloniki, Greece, VASSILIOS FESSATIDIS, Fordham University, Bronx, USA — We analyze the relation between the density of states obtained from the energy derivative of the Friedel phase (or the scattering matrix) and that obtained from the Green's function of quasi-one-dimensional systems with a double delta-function scattering potential. In the case of repulsive scatterers, we show that the local Friedel sum rule is valid when a correction term is included. In the case of attractive scatterers, we show that the local Friedel sum rule is valid provided that the integrated local density of states is specially treated to include the full contribution of the quasibound state. We also show that in a Fano resonance the peak position of the density of states is generally different from the peak position of the transmission probability. However, when the resonance line shape is close to a Breit-Wigner type, those peak positions coincide.

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