Resonance sharpening of Aharanov-Bohm (AB) oscillations in an AB ring with double quantum dots[1] ERIC HEDIN, YONG JOE, Ball State University, ARKADY SATANIN, Institute for Physics of Microstructures, Russia — In a balanced AB ring with an identical QD in each arm, a combination of Breit-Wigner and Fano resonances presents a sensitively balanced region of parameter space in which arbitrarily sharp transmission resonance spikes manifest. The transmission becomes a resonance zero when the electron Fermi energy matches the quasi-bound state energy of the matched QD's. However, for values of magnetic flux through the AB ring which are integral multiples of the flux quantum, the analytical expression of the transmission amplitude (obtained from an exactly solvable tight-binding formalism) becomes indeterminate (zero over zero). The resulting transmission resonances near this critical point can show delta-function like full-transmission spikes as a function of magnetic flux. This effect may have practical application as a sensitive monitor of magnetic flux.

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