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Effects of inter-dot tunnel coupling and magnetic flux on an Aharonov-Bohm ring with double quantum dots CHUNGHEE ROH, ERIC HEDIN, YONG JOE, Ball State University — We analyze the novel quantum transmission through parallel-coupled double quantum dots (QD) in an Aharonov-Bohm (AB) ring by employing an exactly solvable tight-binding formalism. Contour plots of the transmission as a function of energy levels in the dots, which can be controlled by applied gate voltages [1], are shown for different inter-dot coupling strength and magnetic flux. For zero flux and inter-dot coupling, we find a sharp anomaly of suppressed transmission (T=0) when the two QDs have the same energy value with opposite sign. However, tuning the magnetic flux in this system enhances the transmission and changes the widths of a Breit-Wigner and a Fano resonance. In addition, the periodicity of the transmission and the swing of the Fano resonance are also observed to be modulated by the magnetic flux. Finally, we discuss an intersection of resonances and a doubling of the periodicity in the transmission for fixed magnetic flux in the case of coherent tunneling between two QDs (non-zero inter-dot coupling). [1] A.W. Holleitner *et al*, PRL **87**, 256802 (2001).

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