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Flux-Dependent Circular Currents in a Meta-Connected Nano-Ring ERIC HEDIN, YONG JOE, Ball State University — We consider electron transmission properties of a nano-scale ring structure with six embedded quantum dots (QDs). This system can represent a molecular benzene ring structure, which we analyze in the meta configuration (asymmetric system-leads coupling) using a tight-binding model of the Schrödinger equation. Non-classical circular ring probability currents manifest primarily as Fano-type resonances at electron energy values corresponding to double poles in the transmission amplitude. The position and resonance structure of these circular currents shows strong dependence upon the value of the external flux through the ring. Computational results allow us to analyze and compare the overall transmission and circular transmission as a function of flux and the zero-pole configuration of the transmission amplitude as shown in complex energy plane contour plots.

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