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Combined Zeeman and Aharonov-Bohm effects in a double quantum dot ring¹ ABIGAIL PERKINS, ERIC HEDIN, YONG JOE, Ball State University — A mesoscopic Aharonov-Bohm (AB) ring with a quantum dot (QD) embedded in each arm is investigated analytically to provide electron transmission characteristics. A parallel magnetic field provides Zeeman splitting of the QD energy levels. Combined Zeeman energy level splitting and AB-effects occur with a perpendicular field. The contour plots of the transmission as a function of electron energy and magnetic field are presented. Taking advantage of a unique parameter regime in which the AB-oscillations show extreme sharpening [1], the transmission characteristics can be tuned to produce spin-polarized currents.

[1] E. R. Hedin, Y. S. Joe, and A. M. Satanin, Jnl. of Computational Electronics, **7**, 280 (2008), and “Online First,” DOI: 10.1007/s10825-008-0201-y.

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