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**Direct observation of the Aharonov-Casher phase**[1] M. KÖNIG, Physikalisches Institut(EP3) der Universitaet Wuerzburg, Am Hubland, D-97074 Wuerzburg, Germany, E. M. HANKIEWICZ, Texas A&M University, College Station, TX 77843-4242 and University of Missouri-Columbia, Columbia, MO 65211, JAIRO SINOVA, Texas A&M University, College Station, TX 77843-4242, A. TSCHETSCHETKIN, V. HOCK, V. DAUMER, M. SCHÄFER, C. R. BECKER, H. BUHMANN, L. W. MOLENKAMP, Physikalisches Institut(EP3) der Universitaet Wuerzburg, Am Hubland, D-97074 Wuerzburg, Germany — We report the direct observation of Aharonov-Casher effect, which can occur when electrons propagate in a ring structure in the presence of spin-orbit interactions and external magnetic field perpendicular to the ring plane. The transport measurements have been conducted on the series of ring structures fabricated from HgTe/HgCdTe quantum wells. We study Aharonov-Bohm type conductance oscillations as a function of Rashba spin-orbit splitting strength. We observe non-monotonic phase changes indicating that an additional phase factor modifies the electron wave function. We associate these observations with the Aharonov-Casher effect and confirm it by numerical calculations of the magneto-conductance for a multichannel ring within the Landauer-Büttiker formalism.

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