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Scanning Gate Microscopy on a Quantum Hall Interferometer FREDERICO MARTINS, BENOIT HACKENS, AUGUSTIN DUTU, VINCENT BAYOT, Universite Catholique de Louvain, Louvain-la-Neuve, Belgium, HERMANN SELLIER, SERGE HUANT, Institut Neel, Grenoble, France, LUDOVIC DESPLANQUE, XAVIER WALLART, IEMN, Villeneuve d'Ascq, France, MARCO PALA, IMEP-LAHC, MINATEC, Grenoble, France — We perform scanning gate microscopy (SGM) experiments [1] at very low temperature (down to 100 mK) in the Quantum Hall regime on a mesoscopic quantum ring (QR) patterned in an InGaAs/InAlAs heterostructure. Close to integer filling factors ν=6, 8 and 10,the magnetoresistance of the QR is decorated with fast periodic oscillations, with a magnetic field period close to AB/ν, where AB is the Aharonov-Bohm period. We analyze the data in terms of electron tunneling between edge states trapped inside the QR and those transmitted through the QR openings [2]. SGM images reveal that the tip-induced perturbation of the electron confining potential gives rise to a rich pattern of narrow and wide concentric conductance fringes in the vicinity of the QR. [1] F. Martins et al. Phys. Rev. Lett. 99 136807 (2007); B. Hackens et al. Nat. Phys. 2 826 (2006). [2] B. Rosenow and B. I. Halperin, Phys. Rev. Lett. 98, 106801 (2007).

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