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Coherence and indistinguishability of single electron wavepackets emitted by independent sources GWENDAL FEVE, ERWANN BOCQUILLON, VINCENT FREULON, JEAN-MARC BERROIR, Laboratoire Pierre Aigrain, Ecole Normale Supérieure, PASCAL DEGIOVANNI, Ecole Normale Supérieure de Lyon, BERNARD PLAÇAIS, Laboratoire Pierre Aigrain, Ecole Normale Supérieure, ANTONELLA CAVANNA, YONG JIN, Laboratoire de Photonique et Nanostructures — Using two independent on-demand electron sources [1], the emission of two single-electron wavepackets is triggered at different inputs of an electronic beamsplitter. Whereas classical particles would be randomly partitioned by the splitter, we observe two-particle interferences resulting from quantum exchange in this electronic analog [2,3] of the optical Hong-Ou-Mandel [4] experiment. Both electrons, emitted in indistinguishable wavepackets with synchronized arrival time on the splitter, exit in different outputs as recorded by the low frequency current noise. Full random partitioning is recovered when the arrival of one electron is delayed with respect to the other. This two-electron interference experiment demonstrates the possibility to generate on-demand coherent and indistinguishable single-electron wavepackets for quantum information processing in quantum conductors. [1] G. Fève et al., Science **316**, 1169 (2007). [2] Ol'khovskaya et al., Physical Review Letters **101**, 166802 (2008). [3] T. Jonckheere et al., Phys. Rev. B **86**, 125425 (2012) [4] C. K. Hong et al., Physical Review Letters, **59**, 2044 (1987).

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