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Single electron wave packets probed by Hanbury-Brown and Twiss interferometry GWENDAL FEVE, ERWANN BOCQUILLON, FRANCOIS PARMENTIER, Ecole Normale Superieure, Paris, CHARLES GRENIER, Ecole Normale Superieure, Lyon, JEAN-MARC BERROIR, Ecole Normale Superieure, Paris, PASCAL DEGIOVANNI, Ecole Normale Superieure, Lyon, CHRISTIAN GLATTLI, BERNARD PLACAIS, Ecole Normale Superieure, Paris, ANTONELLA CAVANNA, YONG JIN, Laboratoire de Photonique et Nanostructures — The ballistic propagation of electronic waves in the quantum Hall edge channels of a 2DEG bears strong analogies with photon optics which inspired a whole set of experiments, including the realization of electronic Mach-Zehnder [1] and Hanbury-Brown and Twiss [2] interferometers. So far, these experiments have been performed with continuous sources, but the recent realization of on-demand single electron emitters [3] has risen the hope to reach, in these experiments, the single charge control. We report here on the first realization of a Hanbury-Brown and Twiss experiment on a single electron beam generated by the single electron emitter recently developed by our group [3]. Using the chiral edge channels of the quantum Hall effect, single electron emitted by the source are directed towards an electronic beam-splitter. From the low frequency current correlations at the output of the beam splitter, we are able to count and characterize the elementary excitations produced by the source. By analyzing their antibunching with thermal excitations, we show that we are able to shape single particle states in a tuneable way. [1] Ji et al., Nature 422, 415 (2003) [2] Henny et al., Science 284 296 (1999) [3] Fève et al., Science 316, 1169 (2007)

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