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Focused electrojetting for nanoscale 3-D fabrication MINHEE LEE, HO-YOUNG KIM, Seoul National University — Although extreme miniaturization of components in integrated circuits and biochemical chips has driven the development of various nanofabrication technologies, three-dimensional fabrication of nanoscale objects is still in its infancy. Here we propose a novel method to fabricate a free-standing nanowall by the line-by-line deposition of electrospun polymer nanofibers. We show that the electrified nanojet, which tends to get unstable as traveling in free space due to the Coulombic repulsion, can be stably focused onto a narrow line of metal electrode. On the conducting line, the polymer nanojet is spontaneously folded successively to form a wall-like structure. We rationalize the period of spontaneous folding by balancing the tension in the polymer fiber with the electrostatic interaction of the fiber with the metal ground. This novel fabrication scheme can be applied for the development of three-dimensional bioscaffolds, nanofilters and nanorobots.

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