Abstract Submitted
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Quench-condensing superconducting thin films using the Fab on a Chip approach[1] HAN HAN, Boston Univ, MATTHIAS IMBODEN, cole Polytechnique Fdrale de Lausanne, PABLO DEL CORRO, Bajas Temperaturas, Instituto Balseiro, THOMAS STARK, RICHARD LALLY, Boston Univ, FLAVIO PARDO, CRISTIAN BOLLE, SLIM Line, Bell Labs, Alcatel-Lucent, DAVID BISHOP, Boston Univ — Micro-electromechanical systems (MEMS) being manufactured in a macroscopic fab inspires the idea of getting the process further down to fabricate even smaller structures, namely nano-structures, using MEMS. The Fab on a Chip concept was proposed based on such ideas. By implementing the final-step, additive fabrication approach, manufacturing, characterization and experiments of nano-structures are integrated *in-situ*. Due to the miniature size of MEMS, the thickness precision is significantly improved while the power consumption is significantly depressed, making the quench-condensation of very thin films well controlled and easily achievable. Among various types of nano-structures, quench-condensed superconducting thin films are of great interest for physicists. Here we present such experiments done on superconducting thin films quench-condensed using the Fab on a Chip. We show that we are able to fabricate very thin films with its thickness precisely controlled, and the base temperature kept under ˜3K during the process. The resistivity data demonstrates the high purity and uniformity of the film, as well as the annealing effect when cycling to higher temperatures. Based on the tremendous results obtained from the superconducting thin films, more complex nano-circuits can be fabricated and investigated using the Fab on a Chip, enabling a new approach for novel condensed matter physics experiments. This research is funded by the NSF through their CMMI division.

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