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Batch fabrication of nano-SQUIDs for the single spin detection
LEI CHEN, XIXI LIU, ZHEN WANG, XIAOMING XIE, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences — The superconducting quantum interference device (SQUID) is well known as a super sensitive spin detector. The minimal detectable spin number of a SQUID is proportional to the size of its superconducting loop. Hence, nano-SQUIDs consisted of two constricted junctions are possible to be scaled down towards the single spin detection. Here, we are going to present our current research progress on a top-down batch fabrication process of NbN nano-SQUIDs. Ultra-thin NbN film of high quality can be grown on MgO substrate epitaxially. The spin sensitivity of such thin film nano-SQUID can be further enhanced by coupling spins directly to the constricted junctions.

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