Abstract Submitted
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Construction of 3D Metallic Nanowire Arrays on Arbitrarily-Shaped Substrate.[1] FEI CHEN, JINGNING LI, FANGFANG YU, RU-WEN PENG, MU WANG, National laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, China, MU WANG TEAM — Formation of three-dimensional (3D) nanostructures is an important step of advanced manufacture for new concept devices with novel functionality. Despite of great achievements in fabricating nanostructures with state of the art lithography approaches, these nanostructures are normally limited on flat substrates. Up to now it remains challenging to build metallic nanostructures directly on a rough and bumpy surface. Here we demonstrate a unique approach to fabricate metallic nanowire arrays on an arbitrarily-shaped surface by electrodeposition, which is unknown before 2016 [1]. Counterintuitively here the growth direction of the nanowires is perpendicular to their longitudinal axis, and the specific geometry of nanowires can be achieved by introducing specially designed shaped substrate. The spatial separation and the width of the nanowires can be tuned by voltage, electrolyte concentration and temperature in electrodeposition. By taking cobalt nanowire array as an example, we demonstrate that head-to-head and tail-to-tail magnetic domain walls can be easily introduced and modulated in the nanowire arrays, which is enlightening to construct new devices such as domain wall racetrack memory. [1] F. Chen, et al., Adv. Mater. 28, 7193–7199 (2016).

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