Abstract Submitted
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Artificial Nanomagnet With Lateral Confinement[1] LIFENG YIN, ZHENG GAI, Oak Ridge National Laboratory, NOPPI WIDJAJA, Oak Ridge National Laboratory / The Univ. Tennessee, DI XIAO, Oak Ridge National Laboratory, ZHENYU ZHANG, Oak Ridge National Laboratory / The Univ. Tennessee, WARD PLUMMER, The Univ. Tennessee / Louisiana State University, JIAN SHEN, Oak Ridge National Laboratory / The Univ. Tennessee — We introduce a novel way—curved Cu(111) substrate—to smoothly modify the surface states by introducing a miscut angle and study the impact of modifying vicinal surface states on the ferromagnetic behavior of Fe dots. With this curved substrate, the same growth parameter can be ensured in the whole miscut angle studied. When the Fe dot assemblies have an in-plane easy axis, two distinct regimes and a critical terrace width, separating these two regimes, can be identified. There are three contributing factors: the vicinal surface state, the competition between the Fe-dots diameter and the terrace width, and the in-plane uniaxial magnetic anisotropy. The couplings between these three factors lead to the interesting behavior observed in the Fe/vicinal Cu(111) nanodot assemblies.

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