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Molecular Beam Epitaxial Growth and Magnetic properties of Fe(001)/Mn_3N_2(010) Thin Films RONG YANG, Ohio University, ERDONG LU, Ohio University, MUHAMMAD HAIDER, Ohio University, ARTHUR SMITH, Ohio University, DIANA LEITNER, Oberlin College, YUMI IJIRI, Oberlin College — Exchange bias systems have attracted considerable attention due to their importance to magnetic sensor technology. Considering that T_{Neel} of Mn_3N_2 (T_N=652°C) is less than T_{Curie} of Fe (T_C=770 °C), and also since Mn-Mn spacing of Mn_3N_2(010) ($\simeq$2.86 angstrom) is closely matched to the Fe-Fe spacing of Fe(001)(2.87 angstrom), it is therefore of great interest to explore Fe epitaxy on Mn3N2(010). We have grown thin Fe films on Mn_3N_2(010)/MgO(001) using molecular beam epitaxy at 150°C, and then following by annealing at 450°C for 10 minutes. The growth is monitored by reflection high-energy electron diffraction, which shows c(2x2) reconstructed surface for the as-grown sample, and a change to (1x1) after annealing. Annealing leads to a smoothening of the film surface.The epitaxial orientation have been determined to be Fe [100] (001)// Mn3N2[101] (010)//MgO[110](001). Annealed samples are transferred to the in situ analysis chamber for scanning tunneling microscopy studies. Images show smooth terraces and atomic-height steps. Vibrating sample magnetometry measurements found in-plane anisotropy and hysteresis loop shifting after field cooling. The work is supported by NSF9983816 and 0304314.

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