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Molecular Beam Epitaxial Growth of Iron Nitrides on Zinc-Blende Gallium Nitride(001) JEONGIHM PAK, WENZHI LIN, ABHIJIT CHINCHORE, KANGKANG WANG, ARTHUR R. SMITH, Nanoscale and Quantum Phenomena Institute, Department of Physics & Astronomy, Ohio University, Athens, OH 45701 — Iron nitrides are attractive materials for their high magnetic moments, corrosion, and oxidation resistance. We present the successful epitaxial growth of iron nitride on zinc-blende gallium nitride (c-GaN) in order to develop a novel magnetic transition metal nitride/semiconductor system. First, GaN is grown on magnesium oxide (MgO) substrates having (001) orientation using rf N_2-plasma molecular beam epitaxy. Then we grow FeN at substrate temperature of $\sim$ 210 °C up to a thickness of $\sim$ 10.5 nm. *In-situ* reflection high-energy electron diffraction (RHEED) is used to monitor the surface during growth. Initial results suggest that the epitaxial relationship is FeN[001] || GaN[001] and FeN[100] || GaN[100]. Work in progress is to investigate the surface using *in-situ* scanning tunneling microscopy (STM) to reveal the surface structure at atomic scale, as well as to explore more Fe-rich magnetic phases.

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