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**Growth and Magnetic Properties of Iron Nitride Thin Films** AHMED MAHBUB, MAHMUD REAZ, BITHI PAUL, MD. ABDULLAH-AL MAMUN, KARTIK GHOSH, Missouri State University, MISSOURI STATE UNIVERSITY TEAM — Iron Nitride thin films have been a significant research topic for the past few decades due to its potential applications such as magnetic sensor, magnetic hard disks, and spintronics. The biggest challenge in this area is the growth of a single phase material on a substrate. In this research project, iron nitride films were grown using reactive pulsed laser deposition on a silicon substrate. The purpose is to optimize a single phase ?-Fe3N4. The optimization was done by changing the growth parameters in the pulsed laser deposition such as the gas mixture, substrate temperature, and laser energy density. The composition, structure, and surface properties of the films were characterized by X-Ray diffraction, Raman spectroscopy, X-ray photoelectron spectroscopy, and scanning electron microscopy techniques. Temperature and field dependent magnetization has been investigated by superconducting quantum interface device (SQUID) magnetometer and ferromagnetic resonance (FMR) spectroscopy. The detailed analysis of structural and magnetization data will be discussed in this presentation.

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