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Investigation of Stability of Single Mn Monolayers on and in w-GaN(000-1) ABHIJIT CHINCHORE, MENG SHI, KANGKANG WANG, JEONGIHM PAK, ARTHUR SMITH, Ohio University — There has been much interest in dilute magnetic semiconductors involving GaN. Recently, it has become of interest to consider the possible advantages of delta-doped magnetic layers, rather than a random alloy. Here we investigate experimentally the growth of single Mn monolayers on top of GaN as well as the re-deposition of GaN on the Mn monolayer, using a combination of N-plasma molecular beam epitaxy and reflection high energy electron diffraction (RHEED). The single Mn monolayers form a novel $rt3 \times rt3$ R-30deg structure.[1] Upon nitrogen plasma exposure, this periodicity is removed as seen in RHEED. However, even after heating to as high as 700 C, Auger electron spectroscopy shows very little change in the Mn peak intensity. Furthermore, a rapid reduction of Mn Auger electron peak intensity after only 3-5 GaN bilayers of redeposition is seen, showing that Mn is fully covered by the subsequent GaN layers. Therefore the Mn monolayer appears to be quite stable within the GaN (000-1) surface. This work has been supported by DOE (Grant No.DE-FG02-06ER46317) and NSF (Grant No.0730257). Equipment support from ONR is also acknowledged. [1] Chinchore et al., Applied Physics Letters **93(18)**, 181908 (2008).

Kangkang Wang
Ohio University

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