Recent experimental studies have shown that when a current is passed through certain non-centrosymmetric semiconductors (GaAs, ZnSe), a net spin polarization may be generated throughout the material. However, the physical mechanism responsible for this phenomenon, known as current-induced spin polarization (CISP), is still poorly understood but known to exist at high temperatures in wide-bandgap semiconductors. In order to further explore the degree to which CISP depends on the band structure and spin lifetimes of a material, we measure the phenomenon in GaN, a wide-bandgap, non-centrosymmetric semiconductor. A series of n-type GaN epilayers are grown in the wurtzite phase via molecular beam epitaxy at a variety of doping densities chosen to modulate the transverse spin lifetime, $T_2^*$, across its full available range. Using the Kerr effect, CISP is then characterized in these epilayers as a function of excitation energy over a range of temperatures.


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