

Abstract Submitted  
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**Magnetic properties of ZnO nanotips ion-implanted with Fe or Mn** JEREMY RALEY, YUNG KEE YEO, Air Force Institute of Technology, MEE-YI RYU, Kangwon National University, ROBERT HENGEHOLD, Air Force Institute of Technology, TODD STEINER, Georgia Institute of Technology, PAN WU, YICHENG LU, Rutgers University, AIR FORCE INSTITUTE OF TECHNOLOGY COLLABORATION, KANGWON NATIONAL UNIVERSITY COLLABORATION, GEORGIA INSTITUTE OF TECHNOLOGY COLLABORATION, RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY COLLABORATION — ZnO nanotips grown on quartz, sapphire, and glass were implanted with Fe or Mn to a dose of  $5 \times 10^{16}$  ions/cm<sup>2</sup> and subsequently annealed at temperatures from 575 to 800°C in O<sub>2</sub> flowing at 25 sccm. This experiment was undertaken in an attempt to create dilute magnetic semiconductors with ferromagnetic properties persisting to room temperature. After implantation and annealing, the samples were characterized by field and temperature dependent magnetization measurements in a SQUID magnetometer and photoluminescence. All of the samples demonstrated signatures of ferromagnetism (coercive and remanent fields in hysteresis measurements), but not all manifest an optimal annealing temperature. PL measurements are used to detect implant damage recovery and the incorporation of the implanted transition metal into the ZnO nanotips.

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