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Static and dynamic magnetic response in Mn-doped InP diluted magnetic semiconductor (DMS) nanoparticles H. SRIKANTH, P. PODDAR, S. SRINATH, Department of Physics, University of South Florida, Tampa, FL, Y. SAHOO, P.N. PRASAD, IPLB, University at Buffalo, Buffalo, NY — Soft chemical synthesis of nanostructured diluted magnetic semiconductor (DMS) materials is promising for achieving single phase, ferromagnetic materials. We report the first observation of ferromagnetic ordering at 25K in Mn-doped InP nanoparticles of average size 3 nm. A hot colloidal method without any external surfactant was used to synthesize the nanoparticles. Structural and elemental characterizations established the occurrence of the zinc-blende phase of the DMS without any impurity phases. DC, AC and RF susceptibility measurements were done over a wide range in temperature and magnetic fields to probe the static and dynamic magnetic response. The samples showed a ferromagnetic transition at 25K and frozen spin state below 15K. Transverse susceptibility experiments done using a resonant radio-frequency method revealed a strong temperature-dependent effective anisotropy. Frequency dependence observed in the AC susceptibility was reminiscent of spin-glass characteristics.

H. Srikanth
University of South Florida

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