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Giant Magnetic Field-induced Phase Transitions in Dimeric Liquid Crystals. SEYYED MUHAMMAD SALILI, MIROSLAW SALAMONCZYK, Liquid Crystal Institute, Kent State University, Kent, OH 44242, USA, MARIA-GABRIELA TAMBA, Department of Nonlinear Phenomena, Institute for Experimental Physics, Otto von Guericke University Magdeburg, Magdeburg, Germany, SAMUEL SPRUNT, Department of Physics, Kent State University, Kent, OH 44242, USA, GEORG MEHL, Department of Chemistry, University of Hull, Hull HU6 7RX, UK, ANTAL JAKLI, Liquid Crystal Institute, Kent State University, Kent, OH 44242, USA, JAMES GLEESON, Department of Physics, Kent State University, Kent, OH 44242, USA, KENT GROUP COLLABORATION, HULL GROUP COLLABORATION — Liquid crystals are responsive to external fields such as electric, magnetic fields. The first experimental observation of dependence of isotropic to nematic phase transition on the applied magnetic field was done using a strong magnetic field on bent-core nematogens and the phase transition temperature exhibited an upshift of 0.7 C at B=30 T [1]. We report on measurements of giant magnetic field-induced isotropic-nematic transition of chainsticks (nunchuks) type dimeric liquid crystals. Upon using the B=25 T split-helix resistive solenoid magnet at NHMFL, we have observed up to 18 C upshift of the isotropic to nematic phase transition temperature at B=22T. We discuss the results within the context of differential thermodynamic potential and the two basic mean-field theories. To our knowledge, this is the first observation of such huge shifts in the phase transitions of thermotropic liquid ctystals. [1] T. Ostapenko et al, Phys. Rev. Lett. 101, 247801 (2008).

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