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The Effect of Aerosil Network on Liquid Crystal (4O.8) Phase Transition MEHMET RAMAZANOGLU, U. Toronto, SIMON LAROCHELLE, U. Toronto, ROBERT J. BIRGENEAU, U. Toronto and U.C. Berkeley — We report a high resolution x-ray diffraction study of the nematic (N) to smectic-A(SmA)transition in the single-layer smectic (SmA_m) liquid crystal butyloxybenzylidene octylaniline (4O.8) within aerosil dispersion. Aerosils are dispersed in liquid crystal material with a broad range concentration. They dramatically affect the phase transition properties in different liquid crystals [1]. These effects were studied in the view of random field theory introduced by quenched randomness of the silica gel network. The second order N-SmA phase transition and strong first order SmA-CrB freezing transitions are shifted to lower temperatures. SmA line-shape is broadened indicating a short-range order. Correlation lengths and power-law fits show behavior similar to bilayer SmA_d liquid crystals. The present work enables us to test our understanding of random field effects introduced by dispersed aerosils forming a network in SmA_m material. [1] S. Park, R.L. Leheny, R.J. Birgeneau, J.-L. Gallani, C.W. Garland and G.S. Iannacchione, Phys. Rev. E 65 050703(R) (2002)

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