Abstract Submitted for the MAR13 Meeting of The American Physical Society

Supercooled Liquids with Enhanced Orientational Order¹ MICHAEL WÜBBENHORST, SIMONA CAPPONI, KU Leuven, Belgium, SI-MONE NAPOLITANO, Universite Libre de Bruxelles, Belgium — The nature of the glass transition, the transformation of a liquid into a disordered solid, still remains one of the most intriguing unsolved problems in materials science. Recent models rationalize crucial features of vitrification with the presence of medium-range ordered regions coexisting with the isotropic liquid. In lines with this prediction, here we report an extraordinary enhancement in bond orientational order (BOO) in ultrathin films of supercooled polyols, grown by physical vapour deposition. By varying the deposition conditions and the molecular size, we could tune the kinetic stability of the liquid phase enriched in BOO towards conversion into the ordinary liquid phase. We observed a strong increase in the dielectric strength with respect to the ordinary supercooled liquid and slower structural dynamics, suggesting the existence of a metastable liquid phase with improved orientational correlations[1]. [1] 3. S. Capponi, S. Napolitano, and M. Wübbenhorst, Nat. Commun. doi: 10.1038/ncomms2228 (2012).

 $^1\mathrm{The}$ authors acknowledge financial support from the Research Council of the K.U. Leuven, projects No. OT/06/30 and OT/11/065, and financial support from FWO (Fonds Wetenschappelijk Onderzoeks - Vlaanderen) within the project G.0642.08

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Date submitted: 09 Nov 2012 Electronic form version 1.4