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Valley polarization and the polarization mass of composite fermions around $\nu = 3/2$ MEDINI PADMANABHAN, TAYFUN GOKMEN, MANSOUR SHAYEGAN, Dept. of Electrical Engineering, Princeton University, Princeton, NJ 08544 — In two-dimensional electron systems confined to AlAs quantum wells, composite fermions (CFs) around $\nu = 3/2$ are known to possess a valley degree of freedom [1]. The relative occupation of the valleys can be controlled via the application of uniaxial, in-plane strain. In this study, we measure the strain needed to completely valley-polarize the various fractional quantum Hall states around $\nu = 3/2$ as a function of density and compare our results to the theory explaining the complete spin-polarization of CFs in GaAs [2] . While the theory predicts it to be a constant, the energy needed for complete valley-polarization in units of the Coulomb energy is experimentally found to increase with increasing density. Translating this to the language of the 'polarization mass' for the CFs [2], we find an absence of the theoretically expected $\sqrt{B}$ dependence for the polarization mass. [1] N. C. Bishop *et al.*, Phys. Rev. Lett. 98, 266404 (2007) [2] K. Park and J. K. Jain, Phys. Rev. Lett. 80, 4237 (1998)

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