Abstract Submitted for the MAR06 Meeting of The American Physical Society

Ferroelectric domains in dipolar liquids observed by hyper-Rayleigh scattering. DAVID SHELTON, U. Nevada Las Vegas — Hyper-Rayleigh scattering (HRS) is a sensitive probe of polar modes in isotropic media. For the dipolar liquids water, acetonitrile, nitromethane and nitrobenzene the depolarized HRS spectrum is observed to contain a narrow spike at zero frequency shift due to a polar collective mode with a relaxation time greater than 30 ns. This spike in the HRS spectrum is attributed to ferroelectric domains in the liquid. The spike disappears when dilution of a dipolar liquid with a non-polar liquid reduces the dipole coupling strength of the solution below the predicted ferroelectric threshold. The size and dipole order parameter for the ferroelectric domains have been determined from HRS spectra for binary solutions of dipolar molecules.

> David Shelton U. Nevada Las Vegas

Date submitted: 28 Nov 2005

Electronic form version 1.4