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Measuring the GVD of transparent solvents and creation of laser-etched holographic mirrors[1] TIMOTHY SCARBOROUGH, JAMES STROHABER, CHAD PETERSEN, CORNELIS UITERWAAL, University of Nebraska - Lincoln — We report experimental values of the group velocity dispersion (GVD) of water and methanol at 800 nm. These values were measured by sending 50-fs, 800-nm pulses with various amounts of chirp through a cell filled with a solution of fluorescein in these solvents and recording the production of visible 2-photon fluorescence light using a commercial digital camera. This simple setup also gives information on the duration of our pulses and has allowed us to identify behavior consistent with the presence of third-order spectral phase in the pulse. Additionally, we introduce a simple and practical method[1] to create ultrashort, intense optical vortices ('donut modes') for applications using high-intensity lasers. A laser-etching process is used to encode a holographic grating onto laser-quality gold mirrors, which can withstand intensities of up to 10^{12}W/cm^2. With new methods for angular dispersion compensation[2], optical vortices can be produced with intensities $\sim 10^{11}$W/cm^2. [1] Strohaber J, Scarborough T, and Uiterwaal C J G J *Appl. Opt.* **46** 8583 (2007) [2] Strohaber J, Petersen C, and Uiterwaal C J G J *Opt. Lett.* **32** 2387 (2007)

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