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Experimental Observation and Theory of Optical Magnetism in Dielectrics¹ SAMUEL OLIVEIRA, STEPHEN RAND, Division of Applied Physics, University of Michigan — We report the power dependence of extremely intense linear magnetic response to non-relativistic optical fields in water, benzene and carbon tetrachloride at room temperature. Quantitative agreement is obtained with the multipole expansion, showing that transient magnetic dipoles can be as large as half the electric dipole moment under identical conditions at optical frequencies in dielectrics. This discovery will enable optical magnetic resonance and tunable negative index behavior in low-loss media.

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