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Experimental Investigation of the Possibility for Negative Refraction in Si Opals LILIANA RUIZ-DIAZ, MALIK RAKHMANOV, VOLKER QUETSCHKE, Department of Physics, University of Texas at Brownsville, ANVAR ZAKHIDOV, Alan G. MacDiarmid NanoTech Institute, University of Texas at Dallas — Synthetic opals are photonic crystals made of silica nano-spheres arranged in a FCC crystalline structure. Such opals are believed to possess negative refraction for certain wavelength of light. We propagate two laser beams (405 nm and 705 nm) through opal prisms and measure their angles of refraction. We also use a broadband light source to select several frequencies in the visible range with a diffraction grating. In addition, we study the photonic band gaps in this material. For certain directions of the incident light the opal samples exhibit total reflection due to the existence of the photonic band gap.

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