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Visible and near infrared optical nonlinearity of silica nanoaerogels¹ SEONGMIN MA, QIGUANG YANG, JAETAE SEO, K. LEE, H. BROWN, A. JACKSON, T. SKYLES, B. TABIBI, Department of Physics, Hampton University, Hampton, VA 23668, K.P. YOO, S.Y. KIM, Department of Chemical Engineering, Sogang University, South Korea, 121-742, S.S. JUNG, Korea Research Institute of Standards and Science, Daejeon, South Korea, 305-600, M. NAMKUNG, NESB, NASA Langley Research Center, Hampton, VA 23681 — Silica nanoaerogels have attracted great attention in the last decade because of its specific thermal, electrical, optical, and mechanical properties and many potential applications. However, the nonlinear optical property of silica nanoaerogels has not been investigated until our previous work in 2002. In this work, we report new experimental results of the optical nonlinearity of silica nanoaerogels and discuss the origin of the nonlinearity in the visible to near infrared wavelength range. The high nonlinearity and large nonlinear figure of merit show that silica nanoaerogels are a promising candidate for nonlinear photonic applications.

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