

Abstract Submitted
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Barium Titanate nanoparticles: using nonlinearity for biomarkers and phase conjugate nano-mirrors¹ BRIAN YUST, NEEMA RAZAVI, DHIRAJ SARDAR, The University of Texas at San Antonio — Barium titanate (BaTiO₃) is a well known crystal with strong nonlinear optical properties and has been widely used for phase conjugation through four-wave mixing. Recently, it has been reported that these nonlinear properties are still exhibited on the nanoscale. BaTiO₃ particles of varying size are synthesized through precipitation and hydrothermal methods and analyzed optically and morphologically. The nonlinear signals from forward four wave mixing and non-degenerate four wave mixing are verified and characterized. The correlation between wave mixing signal strength and particle size is also investigated. Finally, rare earth ions such as neodymium and europium are doped into BaTiO₃ particles. Both the fluorescent properties and changes in the nonlinear optical properties are studied. The application of these particles as biomarkers and possible phase conjugate nano-mirrors is also discussed.

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