Abstract Submitted
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Nonlinear and Active Optics in Nanolenses[1] KUIRU LI, MARK STOCKMAN, Department of Physics and Astronomy, Georgia State University, Atlanta, GA 30303, USA, DAVID BERGMAN, School of Physics and Astronomy , Tel Aviv University , IL-69978 Tel Aviv, Israel — We consider surface plasmon amplification by stimulated emission of radiation (SPASER) and second harmonic generation (SHG) in an effective nanolens. Such a nanolens is an aggregate of several nanospheres with progressively decreasing radii and separations .....[1]. It has a "hottest spot" of highly enhanced local fields between the smallest spheres. We show that such a system surrounded by semiconductor quantum dots is also an efficient SPASER that generates dark eigenmodes with gigantic, temporarily coherent local fields .()..()[2]. We also consider SHG in the nanolenses where we show that highly enhanced SHG local fields are generated at the nanofocus. Numerical data are presented for silver spheres .[1] K. Li, M. I. Stockman, and D. J. Bergman, *Self-Similar Chain of Metal Nanospheres as an Efficient Nanolens*, Phys. Rev. Lett. **91**, 227402-1-4 (2003). [2] K. Li, X. Li, M. I. Stockman, and D. J. Bergman, *Surface Plasmon Amplification by Stimulated Emission in Nanolenses*, Phys. Rev. B (2005 (In Print)).

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