

Abstract Submitted
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SHG from bulk and surface of nanoparticle composites¹ W. LUIS MOCHAN, CCF-UNAM, BERNARDO S. MENDOZA², Univ. of Toronto — Three wave mixing processes such as second harmonic generation (SHG) have proven to be a sensitive probe of buried interfaces. Recently SHG has been employed to monitor the surface of Si nanocrystals within a glass matrix. Due to the macroscopic homogeneity and centrosymmetry of the composite, its bulk SHG signal is produced by the inhomogeneities of the fundamental light beam, and can be enhanced several orders of magnitude by employing two crossed beams [1]. On the other hand, the surface contribution to the SHG of the composite is due to the relatively large inhomogeneities of the surface local field which act on the nanoparticles, and is therefore insensitive to the beam profile and is not enhanced in a two beam geometry. We calculate the SHG from a thin nanocomposite material and compare the relative strength of its surface and bulk contributions when illuminated with one and for two fundamental beams. We employ our results to analyze recent experiments in which the large contrast between the signal produced by the composite and the matrix in the one beam geometry was lost in the two beam geometry [1].
[1]Figliozzi et al., submitted to Phys. Rev. Lett.

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