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**Multiferroic Behavior in Barium Hexaferrite Probed with Optical Second Harmonic Generation** EFTIHIA VLAHOS, SAVA DENEV, VENKATRAMAN GOPALAN, Pennsylvania State University, TSUYOSHI KIMURA, Bell Laboratory, Lucent Technologies, PENNSYLVANIA STATE UNIVERSITY COLLABORATION, BELL LABS COLLABORATION — Barium hexaferrite  $Ba_{0.5}Sr_{1.5}Zn_2Fe_{12}O_{22}$  is a very promising material, which exhibits significant magnetoelectric (ME) effect, i.e., the generation of electric polarization/magnetization by the application of magnetic/electric) field. Optical second harmonic generation (SHG) in the reflection geometry was used to determine the magnetic point group symmetries and phase transitions of the sample versus temperature, and variable magnetic field. Simultaneous measurements of magnetocapacitance, and ME current as functions of temperature and applied magnetic field are performed and correlated with SHG measurements.

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