

Abstract Submitted
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**Second harmonic generation and non-linear corrections
to the high frequency susceptibility of a multiferroic material**

PHILIP JAVERNICK, TRINANJAN DATTA, Augusta State University — We consider the effects of non-linear (second order) corrections to the high-frequency susceptibilities of a material that is simultaneously ferroelectric and a canted antiferromagnet (multiferroic). The non-linear corrections introduce a second harmonic term in the magnetic, electric, and multiferroic susceptibilities. Using the Landau-Lifshitz equation of motion for the magnetic components and the Landau-Khalatnikov relaxation equation for the electric polarization we theoretically compute the non-linear corrections to the susceptibilities for the optic antiferromagnetic mode, the acoustic mode, and the electric susceptibilities up to second order. Using realistic material parameters we find that the corrections have either a noticeable or negligible effect on the first order susceptibility values.

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