Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Influences of Symmetry in Electromagnetic Scattering by Single Fixed Scatterers MATTHEW BERG, CHRISTOPHER SORENSEN, AMIT CHAKRABARTI, Kansas State University — The scattering of a linearly-polarized plane wave by a uniform, non-absorbent single scatterer can be described in terms of phasors in the complex plane representing the secondary waves radiated from the infinitesimal volume elements of the scatterer. Because of the vector nature of the electromagnetic wave, three phasor distributions are needed to fully describe the scattered wave complete with an account of the wave's polarization state. The evolution of the phasor distributions as a function of scattering angle shows how the secondary waves superimpose and interfere to produce the structure of the scattered wave. Much of the analysis involved in the phasor model relies on symmetries of the phasor distributions. In this work, an investigation of the origin and consequences of these symmetries is presented. It is shown that the symmetries of the scattered wave (both in its magnitude and polarization structure) are directly related to symmetries of the scatterer and the scattering arrangement.

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Date submitted: 19 Nov 2006 Electronic form version 1.4