1046-78-260 **Lyubima Boteva Simeonova*** (simeonov@math.utah.edu), 155 So. 1400 E., Department of Mathematics, Salt Lake City, UT 84102, and **David C Dobson** (dobson@math.utah.edu), 155 So 1400 E, Department of Mathematics, Salt Lake City, UT 84102. *Spatial Bounds on the Effective Complex Permittivity for Time-Harmonic Waves in Random Media.*

The effective complex permittivity for time-harmonic waves in random media is investigated. Wave localization and cancellation must be accounted for when the wavelength is in the same order as the size of the heterogeneities, which means that the effective coefficients are no longer constants as in the quasistatic case, but functions of the space variable. The definition of the effective dielectric coefficient provided comes naturally from the equations. It does not prevent spatial variations and is consistent with the definition of the effective dielectric constant in the quasistatic regime. Numerical results that emphasize the presence of spatial variations in the effective dielectric coefficients as the frequency increases from 0 (which will decrease the wavelength) are presented. These are due to the scattering effects. In two- and three-dimensional media, the spatial variations of the effective dielectric coefficient are bounded in terms of the size of the inhomogeneities, the contrast in the medium, and the frequency. It also shown that as the size of the inhomogeneities goes to zero, the effective coefficient approaches the constant consistent with the one in the quasistatic regime. (Received August 24, 2008)