

Abstract Submitted  
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**Nonlinear Orientational Response of Permanent Dipoles in a Mean Field Potential to Alternating Fields**<sup>1</sup> WILLIAM COFFEY, Department of Electronic and Electrical Engineering, Trinity College, Dublin 2, Ireland, YURI KALMYKOV, Lab. Mathématiques et Physique des Systèmes, Université de Perpignan, 52, Avenue Paul Alduy, 66860 Perpignan Cedex, France, DERRICK CROTHERS, Department of Applied Mathematics and Theoretical Physics, The Queens University of Belfast, Belfast BT7 1NN, N. Ireland , PIERRE-MICHEL DÉJARDIN, Lab. Mathématiques et Physique des Systèmes, Université de Perpignan, 52, Avenue Paul Alduy, 66860 Perpignan Cedex, France — It is shown how the existing theory of the dynamic Kerr effect and nonlinear dielectric relaxation based on the noninertial Brownian rotation of noninteracting rigid dipolar particles may be generalized taking into account interparticle interactions using a mean field potential. The results (available in simple closed form) suggest that the frequency dependent nonlinear response provides a new method of measuring the Kramers escape rate (or in the analogous problem of magnetic relaxation of fine single domain ferromagnetic particles, the superparamagnetic relaxation time).

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