

# A (Non-)Supersymmetric Electrodynamical Model with Asymmetry in the Space and Time Directions

J. P. S. Melo<sup>a</sup>, W. C. Silva<sup>a</sup> e J. A. Helayël-Neto<sup>a</sup>

a) Centro Brasileiro de Pesquisas Físicas

b) Universidade Federal de Juiz de Fora

## Resumo

We propose a supersymmetric extension of an electrodynamic model that exhibits symmetry breaking between the time- and space-like sectors of Dirac-fermion propagation. By preserving the supersymmetry algebra, we implement the superspace in order to construct a  $\mathcal{N} = 1$  supersymmetric  $U(1)$  gauge theory in the presence of the Lorentz-violating background. From this framework, we investigate how this kind of breaking of Lorentz symmetry, initially manifested only in the fermionic degrees of freedom, affects the matter scalar and gauge sectors of the extended model. Furthermore, modified Dirac, Klein-Gordon, and Maxwell equations are presented in this scenario, and their corresponding modified dispersion relations are derived

**e-mail:** joapaulo\_15@hotmail.com