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Dipolar radiation from spinning dust grains coupled to an electromagnetic wave A. GUERREIRO, Universidade do Porto, Porto, Portugal, M. ELOY, Faculdade de Engenharia da Universidade Catolica Portuguesa, J.T. MENDONCA, GOLP, Lisboa, Portugal, R. BINGHAM, Rutherford Appleton Laboratory, Didcot, Oxon — We present a model for the emission of radiation by elongated polarized dust grains under the influence of both an external electromagnetic wave and a constant background magnetic field. The dust, exhibiting rotational motion at the external electromagnetic field frequency ω_0 as well as quivering motion at frequency Ω , proportional to the em field amplitude, will radiate with frequencies that will depend on the external field wavelength and amplitude. Two different types of radiated spectra can be observed, one, pertaining to small field amplitudes, with frequencies ω_0 , and sidebands $\omega_0 \pm n\Omega$ and $\omega_0 \pm 2n\Omega$ and the other, corresponding to large field amplitudes, exhibiting frequencies at ω_0 , and also at the quivering frequency Ω and 2Ω and at twice the quivering frequency $2\Omega \pm \omega_0$. Since the amplitude and the frequency of the background electromagnetic field are independent parameters, this model establishes a correlation between different spectral components of galactic dipolar emission, which may explain the correlation between a component of the Galactic microwave emission and the $100\mu\text{m}$ thermal emission from interstellar dust that has been recently measured.

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