Momentum-phase correlation in muon decay

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The evolution of the polarization in an electromagnetic field is given by the

$$\frac{d\mathbf{S}}{dt} = \mathbf{s} \times (\mathbf{\Omega}_{BMT} + \mathbf{\Omega}_{EDM}) \tag{1}$$

where

$$\mathbf{\Omega}_{BMT} = -\frac{q}{mc}\left[\left(\frac{1}{\gamma} + a_\mu\right) c\mathbf{B} - \frac{a_\mu \gamma c}{1+\gamma}(\boldsymbol{\beta}\cdot\mathbf{B})\boldsymbol{\beta} - \left(a_\mu + \frac{1}{1+\gamma}\right)\boldsymbol{\beta}\times\mathbf{E}\right]$$

$$\mathbf{\Omega}_{EDM} = -\frac{q\eta}{2mc}\left[\mathbf{E} - \frac{\gamma}{1+\gamma}(\boldsymbol{\beta}\cdot\mathbf{E})\boldsymbol{\beta} + c\boldsymbol{\beta}\times\mathbf{B}\right]$$