

$$\vec{\omega} = -\frac{e}{m} \left[a_{\mu} \vec{B} - \left(a_{\mu} - \frac{1}{\gamma^2 - 1} \right) \frac{\vec{\beta} \times \vec{E}}{c} + \frac{\eta}{2} \left(\vec{\beta} \times \vec{B} + \frac{\vec{E}}{c} \right) \right]$$