Schwinger's formula and the axial Ward identity for chirality production

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How to Generate Chirality with the Schwinger Mechanism?

Vacuum expectation values when $\langle \Omega_{in}| \neq \langle \Omega_{out}|$?

Axial Ward Identity VEV?

$$\partial_\mu j^{\mu 5} = 2im\bar{\Psi}\gamma^5\Psi + \frac{e^2}{2\pi^2}\vec{E}\cdot\vec{B}$$

Schwinger Pair Production

$$\text{Num. of pairs} = 1 - |\langle \Omega_{out}|\Omega_{in}\rangle|^2$$

Homogeneous parallel electric, E, and magnetic, B, fields:

$$\langle \Omega_{in}| \bar{\Psi}\gamma^5\Psi |\Omega_{in}\rangle = \frac{ie^2EB}{4m\pi^2}\left[1 - \exp\left(-\frac{m^2\pi}{eE}\right)\right]$$

$$\langle \Omega_{in}| \partial_\mu j^{\mu 5} |\Omega_{in}\rangle = \frac{e^2EB}{2\pi^2}\exp\left(-\frac{m^2\pi}{eE}\right)$$

Generation of chirality with mass effects!