

# Model-independent results on parity violation in the trace anomaly

*Friday, January 24, 2025 9:40 AM (25 minutes)*

Anomalous parity violation in four dimensions would be significant for phenomenology (baryogenesis, gravitational waves) and mathematical physics. Over the past decade, there has been a controversy in the literature as to whether free Weyl fermions give rise to (anomalous) parity violation in the trace of the energy momentum tensor; expressed by the Pontryagin densities  $R\tilde{R}$  and  $F\tilde{F}$ . We proposed a resolution to this controversy based on the path integral, while addressing any ill-definiteness that arises.

In a subsequent work, we came to the stronger conclusion that for any theory compatible with dimensional regularisation, the Pontryagin-terms are equally absent. It is the finiteness of the diffeomorphism, the Lorentz and the gauge anomalies that prevents anomalous parity violation.

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