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Anomaly with a non-relativistic dispersion relation

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We use several methods to study the case of chiral anomaly with a non-relativistic dispersion relation $H = \frac{p^2}{2m} + \lambda \sigma \cdot p$, which might be useful in special condensed matter state. where H means halmitonian. λ is just a constant coeffecient.

we will show the results with different explanations in each methods. For example, the anomaly disappears for the lack of UV divergence in one loop feynman diagram with field theory method. And in wigner function methods, it canceled in intergration of 4-D momentum.

we will also show the chiral kinetic equation for quasi-particles by effective field theory, and the looked-like anomaly in it.

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