Contribution ID: **25** Type: **not specified**

Fermion-Monopole Scattering in a Chiral Gauge Theory

Wednesday, 25 September 2024 12:35 (25 minutes)

The scattering of low-energy charged massless fermions on magnetic monopoles in the s-wave presents a long-standing final state puzzle: it seems to be generally impossible to construct an outgoing state conserving all global and gauge charges. Indeed, bosonizing the low-energy EFT, one is seemingly led to particles of fractional charge.
In this talk I describe this problem starting from a UV complete chiral gauge theory, and descending to the EFT. This step allows us to discuss and exclude some existing proposed solutions to the puzzle. We then find that a correct bosonization of the theory does give a meaningful outgoing state, at the price of introducing a topological operator similar to one suggested in arxiv:2306.07318.

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