Abstract Submitted
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Bulk/Boundary Relations in Hydrodynamics with Quantum Anomalies GUSTAVO MONTEIRO, ALEXANDER ABANOV, Stony Brook University — It is well-known that Quantum Hall systems can be described as incompressible fluids. Their effective hydrodynamics description contains anomalous topological terms that reflect broken parity. These terms together with gauge symmetry generate topologically protected gapless states propagating on the boundary. We consider similar relations between quantum anomalous terms in hydrodynamics of two and one-dimensional systems. Our starting point is the relativistic hydrodynamics in 2+1 dimensions with parity odd terms [1, 2]. These terms are present due to quantum anomalies in the underlying field theory. We introduce domain walls to our system and derive the propagating mode along these domain walls. These edge modes are chiral and their effective action generalizes the one found in [3]. Furthermore, they are present even in the absence of external magnetic field and do persist at non-zero temperatures. As result, we find some relations between the anomalous transport in the bulk and at the boundary. We also discuss similar reductions in higher dimensional cases. [1] A. Nicolis and D. T. Son, arXiv:1103.2137 [2] F. M. Haehl and M. Rangamani, arXiv:1305.6968 [3] S. Dubovsky, L. Hui, and A. Nicolis, arXiv:1107.0732

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