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Framing Anomaly in the Effective Theory of Fractional Quantum Hall Effect ANDREY GROMOV, ALEXANDER ABANOV, Stony Brook University, GIL YOUNG CHO, YIZHI YOU, EDUARDO FRADKIN, University of Illinois at Urbana-Champaign — While the classical Chern-Simons theory is topological, its quantum version is not as it depends on the metric of the base manifold through the path integral measure. This phenomenon is known as the framing anomaly. It is shown that accounting for the framing anomaly of the quantum Chern-Simons theory is essential to obtain the correct gravitational linear response functions of fractional quantum Hall systems (FQH). In the lowest order in gradients the effective action includes Chern-Simons, Wen-Zee and gravitational Chern-Simons terms. The latter term has a contribution from the framing anomaly which fixes the value of thermal Hall conductivity and generates a “finite size correction” to the Hall viscosity of the FQH states on a sphere. We also discuss the effects of the framing anomaly on linear responses of non-Abelian FQH states.

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