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Log divergence in finite-size quantum Riemann metric TIAGO SOUZA, MICHAEL KOLODUBETZ, ANATOLI POLKOVNIKOV, Boston University — We study the geometric tensor, an object that describes distances between quantum states within a ground state manifold. Traditionally, it has been studied for changes in external parameters, e.g., magnetic field, at fixed system size. Here, instead, we treat the system size as a tunable parameter, and hence analyze the distance between wave functions at different system sizes. For some simple fermion models, we find that the geometric tensor diverges logarithmically with system size in the thermodynamic limit, similar to the entanglement entropy in a CFT. We discuss similar calculations for the XY model, and comment on the relationship to RG.

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