

Abstract Submitted  
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**Interactions and Bosonization for Topological Insulators** DAVID SCHMELTZER, City College of N.Y. — The time reversal symmetry  $T^2 = -1$  imposes restriction on the eigenvectors when transported in the Brillouin Zone, resulting in momentum dependent vector potentials which is sensitive to obstructions. The study of electron-electron interactions is done using the Hubbard Stratonovici field which are treated similarly to external electromagnetic fields. The integration of the fermion field is done using the gauge fields in momentum space, which obey special gauge imposed by the eigenvectors. The effect of the interaction is similar to the magnetoelectric response, due to the Hubbard Stratonovici field we find that the magnetoelectric response is controlled by a fractional topological angle. Using the time reversal symmetry  $T^2 = -1$  we construct the Bosonization for one and two dimensions and use the formulation to study interactions.

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