Effect of electron-electron interaction on surface transport in three-dimensional topological insulators HRIDIS PAL, DMITRII MASLOV, University of Florida — We study the effect of electron-electron interaction on the temperature dependence of surface charge transport in three dimensional topological insulators. In conventional two dimensional materials at small temperatures, the presence or absence of $T^2$ dependence in the resistivity is found to depend on the Fermi surface geometry—whether it is concave or convex and whether it is simply connected or multiply connected. In the recently discovered three-dimensional topological insulators such as Bi$_2$Te$_3$, Bi$_2$Se$_3$, and Sb$_2$Te$_3$ the Fermi surface of the two dimensional surface states, owing to the underlying lattice symmetry, changes curvature from convex to concave as a function of energy. The contribution from electron-electron interaction is therefore expected to affect the resistivity in these materials which we investigate in this study.