Different roles of Zn$^{2+}$ and Li$^+$ impurities in the CuO$_2$ plane in undoped cuprate compounds JIAWEI MEI, Institute for Theoretical Physics, ETH Zurich — A planar Mott insulator with easy plane Neel order can be mapped unto a Gutzwiller projected topological insulator model. Under the assumption that the projection operator can be permuted, Zn$^{2+}$ and Li$^+$ impurities can be represented as vacancies introducing a zero mode, which has a local spin moment for Zn$^{2+}$ and a charged hole for Li$^+$, respectively. While the local spin moment for Zn$^{2+}$ is screened by the long-range spin correlations, the active charge degree of freedom for Li$^+$ impurity twists the spin background. This proposal explains the very different roles of the Zn$^{2+}$ and Li$^+$ impurities in the CuO$_2$ plane in the undoped cuprate compounds.