Casimir Torque between Topological Insulators: a Physical Implication of the Surface State Hexagonal Warping Effect LIANG CHEN, North China Electric Power University, KAI CHANG, Institute of Semiconductors, Chinese Academy of Sciences — We use a variation of the Lifshitz formula to calculate the anisotropic Casimir energy density between two topological insulators in the vacuum. We find that the hexagonal warping effect can induce a Casimir torque between the two topological insulators, \( T_c \propto \sin(6\theta) \) with twisted angle \( \theta \). The maximal Casimir torque at \( \theta = \pi/12 \) is estimated to be \( \sim 10^{-19} N \cdot m/\text{rad} \) for Bi\(_2\)Te\(_3\) on the [111] surface when the distance between the two topological insulators is about 20 nm and the surface areas are taken to be \( \sim 1cm^2 \).