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**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 $\sim 10^{-19} N \cdot m/rad$ for $Bi_2Te_3$ on the [111] surface when the distance between the two topological insulators is about 20 $nm$ and the surface areas are taken to be $\sim 1cm^2$.

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