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Topological charge pumping effect by the magnetization dynamics on the Surface of Three-Dimensional Topological Insulators HIROAKI UEDA, AKIHITO TAKEUCHI, GEN TATARA, Tokyo Metropolitan University, TAKEHITO YOKOYAMA, Tokyo Institute of Technology — We discuss a current dynamics on the surface of a 3-dimensional topological insulator induced by magnetization precession of a ferromagnet attached. It is found that the magnetization dynamics generates a direct charge current when the precession axis is within the surface plane. This rectification effect is due to a quantum anomaly (parity anomaly) and is topologically protected. The robustness of the rectification effect against first-varying exchange field is confirmed by the explicit calculation, where we adopt the dimensional regularization to remove the divergence which is inevitable in the study on the electromagnetic response of the Dirac system.

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