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Tunneling Seebeck and Anomalous Nernst effects in three-dimensional topological insulators¹ CHENGHAO SHEN, BENEDIKT SCHARF, ALEX MATOS-ABIAGUE, IGOR ZUTIC, State University of New York at Buffalo — We theoretically investigate the longitudinal (Seebeck) and transverse (Nernst) thermopowers generated by thermally-induced tunneling across a magnetic barrier on the surface of a three-dimensional insulator. As a manifestation of Klein tunneling, the tunneling Seebeck coefficient exhibits oscillatory behavior with respect to the barrier thickness. Moreover, in spite of the absence of a source of spin polarization (only the barrier is magnetic), the tunneling anomalous Nernst coefficient is not only finite but can even be much larger than its Seebeck counterpart.

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