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**Rotating spin density wave and inverse spin pumping in quantum spin Hall edges** QINGLEI MENG, TAYLOR HUGHES, SMITHA VISHVESHWARA, University of Illinois Urbana-Champaign — We explore interaction effects in quantum spin Hall (QSH) edges in the presence of a finite bias voltage. Using bosonization techniques, we show that repulsive interactions give rise to a spin density wave phase in which the transverse magnetization shows spatial rotation. The effect of a finite bias voltage on this phase is to give the rotation a temporal variation. Using spin transfer torque methods, we show that the system can induce an inverse spin pumping effect in which the magnetic moment of a ferromagnet placed in its proximity can be made to rotate. We demonstrate that this device is equivalent to an electric inductor and in principle can also emit microwave radiation, thus providing a unique ways of probing QSH properties.

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