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Experimental Studies of Ferromagnetism in Topological Insulators

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Breaking of time reversal symmetry has proven to be an incisive method for experimentally drawing out the exotic nature of topological insulators. In particular, the introduction of magnetic dopants in to three dimensional topological insulators has led to the realization of theoretically predicted novel types of ferromagnetic order and a quantized version of the anomalous Hall effect. Here, I will present recent work on the synthesis and measurement of bulk and thin film topological insulators doped with $3d$ transition metals. I will discuss the ferromagnetic order that arises in various systems and the associated electrical transport response of the surface modes.