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Spin and Charge Transport in Thin Films of Topological Insulators ALEXANDER ZYUZIN, ANTON BURKOV, University of Waterloo — We develop a theory of spin-charge coupled transport in thin films of topological insulator materials, when the top and bottom surfaces of the sample hybridize. We find significant differences from the case of transport on unhybridized surfaces. In particular, we find significant reduction of the spin relaxation rates, which enhances all the spin-related transport effects, compared to the case of a single surface. We also find that the out-of-plane component of the spin, which is absent from the hydrodynamic transport equations in the single surface case, reappears when the surfaces are hybridized.

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