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Conserved dissipationless spin current in a doped Mott insulator S.P. KOU, MIT, X.L. QI, Z.Y. WENG, Tsinghua Univ. — The existence of conserved non-dissipative spin Hall currents has been shown in a strongly correlated system. The spin Hall conductance is determined by intrinsic bulk properties, which is independent of dissipation and remains finite even when the charge resistivity diverges at low temperature in strong magnetic fields, corresponding to a spin Hall insulator. Such a system is a doped Mott insulator described by the phase string theory and the spin Hall currents coexist with the Nernst effect in a low-temperature pseudogap phase. Possible applications in spintronics will be also discussed.

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