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Dimensional decoupling at continuous Mott transitions LIUJUN ZOU, Department of Physics, Harvard University, T SENTHIL, Department of Physics, Massachusetts Institute of Technology — For continuous Mott metal-insulator transitions in layered two dimensional systems, we demonstrate the phenomenon of dimensional decoupling: the system behaves as a three-dimensional metal in the Fermi liquid side but as a stack of decoupled two-dimensional layers in the Mott insulator. We show that the dimensional decoupling happens at the Mott quantum critical point itself. We derive the temperature dependence of the interlayer electric conductivity in various crossover regimes near such a continuous Mott transition, and discuss experimental implications.

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