

Quantum Geometry and Nonlinear Electronic Transport in Kagome Bilayers

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In this paper, we investigate the quantum metric-induced nonlinear transport phenomena on bilayer Kagome lattice systems in the non-interacting limit in the tight-binding approach.

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I. INTRODUCTION

- Background on the kagome lattice and physics.
- Nonlinear transport phenomena coming from the quantum metric
- **Focus of the research:** Nonlinear transport phenomena based on the quantum metric that could arise in bilayer magnetic kagome systems
- **Research gap/ question:** In nature, there are families of kagome materials with: 1) spin-orbit coupling 2) magnetism, including various magnetic orderings. The goal now is to shed light on quantum metric transport in these systems, and see if there is something new one

can learn from it.

II. KAGOME MODELS

III. NONLINEAR TRANSPORT FROM THE QUANTUM METRIC (BCP EFFECT)

IV. METHODOLOGY

Explanation of the numerical calculations being done and the simulation parameters

V. RESULTS

VI. DISCUSSION AND OUTLOOK

[1] E. Tang, J.-W. Mei, and X.-G. Wen, Physical Review Letters **106**, 236802 (2011).