

# Partial Equilibration of Edge Channels and Probing Topological Orders in Fractional Quantum Hall Effect at $\nu = 5/2$

Kwok Wai (Ken) Ma

## Abstract

Numerous topological orders were proposed in the fractional quantum Hall effect at the filling factor  $\nu = 5/2$ . A predominance of numerical results support the Pfaffian or anti-Pfaffian orders in GaAs at electron density  $n \sim 3 \times 10^{11} \text{ cm}^{-2}$ . However, experimental results have always been in tension with these two orders and seemed to rule them out. The recent thermal conductance experiment supports the particle-hole symmetric Pfaffian (PH-Pfaffian) order. In this talk, I will discuss partial equilibration of edge channels and employ the idea in an attempt to reconcile the experimental data at  $\nu = 5/2$  with the numerically favored anti-Pfaffian state. This mechanism requires some unlikely but not impossible assumptions at  $\nu = 5/2$ , including a numerical coincidence. At several other filling factors, a similar mechanism works naturally without fine tuning. It explains the poorly quantized data at  $\nu = 8/3$  and predicts a dramatic increase of thermal Hall conductance at  $\nu = 8/5$ .