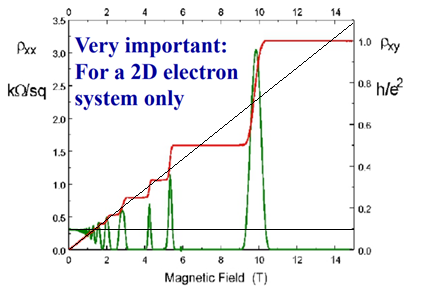
**Hall Conductivity**

So back when we analyzed the conductivity for independet electrons in a magnetic field, with impurities, we found the following plots. The black lines were the classical plots, and the red/green guys are the quantum ones – evincing the so called Integer Quantum Hall Effect.



But according to our analysis, once we get past B = B1 (around 14T in this plot), where ν = 1, there should be no more plateaux. But turns out there are. Can see this taking a look at another plot where B is further increased, and ν thereby decreased. There are tiny plateaux at all rational fraction values it seems.

Diagram

Description automatically generated

These occur due to the e-e interaction, when the ground state wavefunction takes the form described by Laughlin, in the previous file. Not going to derive this, but for such wavefunction, can show that we get:

