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The mass of the electron in Shubnikov-de Haas effect:Spin-charge locking KESHAV SHRIVASTAVA, University of Hyderabad — At low temperatures, the integration over the Fermi distribution leads to x/sinh x type expression which is called the Dingle's formula. The spin symmetry is found to modify this formula which determines the oscillation amplitude of resistivity as a function of magnetic field. The theory introduces the effective charge so that the cyclotron frequency gets fractionalized resulting into $m/\nu_{\pm}$. At a certain magnetic field 1.5m is found instead of m. The Shubnikov-de Haas effect uses quantization of Landau levels but not the flux quantization. Hence we find that there is a "quantized S-dH effect" which measures the m/h^2. We determine that when fractional values of the filling factor are taken into account, the mass of the electron, equal to the band mass is obtained.

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