

Abstract Submitted
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Thermodynamics in a complete description of the Landau diamagnetism S. CURILEF, F. OLIVARES, F. PENNINI, Universidad Catolica del Norte — We analyze some consequences that come from semiclassical measures as the Wehrl entropy and the Fisher information for the problem of a particle in a magnetic field starting from a complete description of the Husimi function. We discuss in the most complete form (three dimensions)[1] some results related to measures in contrast with the incomplete form (two dimensions)[2,3]. The formulation in two dimensions is sufficient unto itself to explain the problem whenever the length of the cylindrical geometry of the system is large enough. Our semiclassical description constitutes a useful framework to illustrate problems related to size effects, role of boundaries and other typical anomalies derived from the size of the system, which are referred to two parameters as area and length and they explicitly appear in the form of the limiting temperature and magnetic field. In addition, we discuss that the zero temperature can be achieved only if the length of the system size is large enough, otherwise physical properties strongly depend on the size of the system. Moreover, from the quantization of the quantum Hall effect, we have obtained a family of quantized Wehrl entropies.

- [1] F. Olivares, et al, PRE **81** 041134 (2010);
- [2] D. Herrera, et al, Eur J Phys **29** 439 (2008);
- [3] S. Curilef, et al, PRB **71** 024420 (2005).

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