Abstract Submitted
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**Semiclassical theory of non-local statistical measures: residual Coulomb interactions**[1] STEVEN TOMSOVIC, Washington State University, DENIS ULLMO, Laboratoire de Physique Theorique et Modeles Statistiques, ARND BAECKER, Technische Universitaet Dresden — Within the context of quantized chaotic billiards, random plane wave and semiclassical theoretical approaches were applied to an example of a relatively new class of statistical measures, i.e. measures involving both complete spatial integration and energy summation as essential ingredients. A quintessential example comes from the desire to understand residual Coulomb interactions contributions to the ground state energy of ballistic quantum dots. Billiards, fully chaotic or otherwise, provide an ideal class of systems on which to focus as they have proven to be successful in modeling the single particle properties of a Landau-Fermi liquid in typical mesoscopic systems, i.e. closed or nearly closed quantum dots. It happens that both theoretical approaches give fully consistent results for measure averages, but that surprisingly for fully chaotic systems the semiclassical theory gives a much improved approximation for the fluctuations. Comparison of the theories elucidates two shortcomings of the oft-relied-upon random plane wave approach. Non-fully chaotic systems are treated as well.

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