



Mathematical Physics

A New Estimate on the Two-Dimensional Indirect Coulomb Energy

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We prove a new lower bound on the indirect Coulomb energy in two dimensional quantum mechanics in terms of the single particle density of the system. The new universal lower bound is an alternative to the Lieb--Solovej--Yngvason bound with a smaller constant, $C=(4/3)^{3/2}\sqrt{5\pi-1}\approx 5.90 < C_{\text{LSY}}=192\sqrt{2\pi}\approx 481.27$, which also involves an additive gradient energy term of the single particle density.

Subjects: **Mathematical Physics (math-ph)**; Quantum Physics (quant-ph)

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