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A study of a nonuniform, non-interacting electron gas in two dimensions.[1] MICHAEL KOIVISTO, M. J. STOTT, Department of Physics, Queen's University — The study of an impurity in a two dimensional, non-interacting electron gas (Zaremba, et. al., Phys. Rev. Lett. 90, 046801 (2003)) shows significant simplifications over the three dimensional case. Linear response theory appears to have a wide range of validity even when the potential is sufficiently attractive to bind an electron. We have carried out an investigation of this two dimensional case, and studied both the electron density and energy associated with the impurity for cases of both attractive and repulsive potential. The significance of the results for density functional theory for a two dimensional system of fermions is investigated.

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