

# Polarization in graphene Veselago lenses

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We perform a theoretical study of graphene Veselago lenses that are formed by  $n$ - $p$  junctions. In particular, we look at how the ideal focussing, which was predicted for the Dirac Hamiltonian [1], is affected by various modifications of the system. For instance, an interesting question is whether initial pseudospin polarization leads to some sort of symmetry breaking in the system.

We study how the properties of the focal point depend on these modifications using a semiclassical approach based on the Pearcey function. By comparing these results to the exact solutions, we establish that semiclassical methods provide a very effective way to study Veselago lensing. We also compare our results with numerical simulations and find good agreement.

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## References

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- [1] V. V. Cheianov, V. Falko, and B. L. Altshuler, *Science* 315 (2007) 1252