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Deconfined fractional electric charges in graphene at high magnetic fields[1] CHANG-YU HOU, Universiteit Leiden, CLAUDIO CHAMON, Boston University, CHRISTOPHER MUDRY, Paul Scherrer Institut — The resistance at the charge neutral (Dirac) point was shown by Checkelsky *et al* in Phys. Rev. B **79**, 115434 (2009) to diverge upon the application of a strong magnetic field normal to graphene. We argue that this divergence is the signature for a Kekulé instability of graphene, which is induced by the magnetic field. We show that the strong magnetic field does not remove the zero modes that bind a fraction of the electron around vortices in the Kekulé dimerization pattern, and that quenched disorder present in the system makes it energetically possible to separate the fractional charges. These findings, altogether, indicate that graphene can sustain deconfined fractionalized electrons.

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