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Fracture size effects in defected graphene[1] ALESSANDRO LUIGI SELLERIO, STEFANO ZAPPERI, CNR - IENI — We investigate fracture in a monolayer graphene with a small concentration of vacancies by molecular dynamics simulations. We simulate monolayers of varying size encompassing more than three decades, and we systematically study the mechanical failure following simulated "constant engineering strain" conditions. We compute the fracture strength distribution as a function of system size and defect concentration and compare the results with extreme value statistics. We highlight similarities and differences between the size effects expected in the fracture of macroscopic disordered solids with those observed at the nanoscale.

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