Local defect in a magnet with long-range interactions THOMAS
VOJTA, JOSE HOYOS, Dept. of Physics, University of Missouri-Rolla — We in-
vestigate a single defect coupling to the square of the order parameter in a nearly
critical magnet with long-range spatial interactions of the form $r^{-(d+\sigma)}$, focusing on
magnetic droplets nucleated at the defect while the bulk system is in the paramag-
netic phase. Because of the long-range interaction, the droplet develops a power-law
tail which is energetically unfavorable. However, as long as $\sigma > 0$, the tail contri-
bution to the droplet free energy is subleading in the limit of large droplets; and
the free energy becomes identical to the case of short-range interactions. We also
study the droplet quantum dynamics with and without dissipation; and we discuss
the consequences of our results for defects in itinerant quantum ferromagnets.

Thomas Vojta
Dept. of Physics, University of Missouri-Rolla