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*Universality of the weak pushed-to-pulled transition in systems with repulsive interactions*

We consider a  $d$ -dimensional gas in canonical equilibrium under pairwise screened Coulomb repulsion and external confinement, and subject to a volume constraint. We show that its excess free energy displays a generic third-order singularity separating the pushed and pulled phases, irrespective of range of the pairwise interaction, dimension and details of the confining potential. The explicit expression of the excess free energy is universal and interpolates between the Coulomb (long-range) and the delta (zero-range) interaction. The order parameter of this transition - the electrostatic pressure generated by the surface excess charge - is determined by invoking a fundamental energy conservation argument.

Joint work with Paolo Facchi, Marilena Ligabo' and Pierpaolo Vivo.