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Polymer-induced depletion attraction between nanoparticles in confined conditions VICTOR PRYAMITSYN, VENKAT GANESAN, University of Texas at Austin — We studied the polymer-mediated depletion pair interaction between nanoparticles and/or proteins in polymer solutions in confined conditions. The self-consistent field (SCF) theory for a polymer - nanoparticles systems in confined systems is solved numerically by using the pseudo-spectral method. We have analyzed the behavior of non-adsorbing particles in a polymer solution near a non-adsorbing wall for which the polymer mediated particle-particle and particle-wall interaction in such systems are known to be a depletion attraction. Our main results for such system are the following: polymer depletion from the wall causes the polymer density to decrease near the wall and reduces the particle-particle depletion attraction near the wall. In a similar manner, the particle-wall attraction is also screened due to presence of another particle. Our results surprisingly suggested a simple scaling to rationalize the wall-mediated interparticle potentials. Specifically, the wall-mediated depletion interactions were shown to be semi-quantitatively captured by the depletion interaction between two particles in an unconfined polymer solution at a density corresponding to the density of the polymer solution at midpoint between the two particles. These results suggest that the phase behavior of

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