

Spatially confined fluid with the Yukawa potential of interaction

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Hard wall confined fluid with Yukawa potential of interaction is considered. The solution of the inhomogeneous Ornstein-Zernike equation for the pair correlation function is obtained. The expression for the particle density profile is found by the method of functional differentiation of free energy with respect to the external field. The contribution to the behavior of particle density near the surface is made by the initial potential as well as by the collective screening interaction effects. It is shown that the contact value of the profile satisfies the condition of the contact theorem. Dependence of the adsorption coefficient on the particle density is calculated. It is also shown that in the case of attractive Yukawa interaction the sign of the adsorption coefficient changes with the increase of the particle density.