Kirkwood–Salzburg equation for truncated correlation functions

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An infinite system of nonlinear Kirkwood–Salzburg equations is derived for the truncated correlation functions (TCF) of a continuous system of classical point particles interacting via a pair potential. The density equation is considered, which takes into account only 2-particle correlations between particles. A qualitative analysis of the behavior of this equation is carried out from the point of view of finding possible critical points indicating the existence of phase transitions for different values of temperature and chemical potential. The next step will be the application of numerical methods and higher correlations.

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