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Phys 343 project

Cluster expantions

A powerful technique in statistical mechanics is the cluster expansion. Where one expands the partition function of an interacting system, mainly a gas , around a union of non-interacting particles (clusters). The expansion converges particularly when the interaction is weak. This method is first developed by Mayer & Montroll (1941). Sometimes it is known as Mayer expansion. Given the suggested references, summarise your understanding of cluster expansion technique in the following points:

1. Partition function of an ideal gas
2. Overview of the method
3. Example of cluster expansion.

You should include the references in your project

○ Van Kampen, N. G. (1961). A simplified cluster expansion for the classical real gas. Physica, 27(8), 783-792.
○ S. Teitel (2004) Lecture notes in statistical mechanics, Lecture 25 .
   `http://www.pas.rochester.edu/~stte/phy418S04/lectures.html`

Best Regards,

Dr Salwa Alsaleh