

[tex118] FD gas in \mathcal{D} dimensions: chemical potential II

Start from the results derived in [tex117] to infer the following expressions for the fugacity z and the chemical potential μ at $T \ll T_F$:

$$\ln z \rightsquigarrow \frac{T_F}{T}, \quad \frac{\mu}{k_B T_F} = 1 - \frac{\pi^2}{12} (\mathcal{D} - 2) \left(\frac{T}{T_F} \right)^2 + \mathcal{O}(T^3).$$

Solution: