$\beta = \frac{1}{k_b T}$, k_b is Boltzmann Constant, T is temperature

P_{exc} is the excess pressure

e=$\frac{E_{total}}{V}$, E_{total} is the total energy, V is volume

ρ is number density

For vapor, we fit the βP_{exc}, ρe_{exc} together, their polynomials as follow:

$$\beta P_{exc} = \sum_{n=n_{min}}^{n=n_{max}} \sum_{m=m_{min}}^{m=m_{max}} (n-1) a_{nm} \rho^n \beta^m$$

$$\rho e_{exc} = \sum_{n=n_{min}}^{n=n_{max}} \sum_{m=m_{min}}^{m=m_{max}} m a_{nm} \rho^n \beta^{m-1}$$

$$n_{min} = 2, n_{max} = 3, m_{min} = -3, m_{max} = 1$$