

### 7.1 3D→2D condensation of ideal gas

(a) Calculate the chemical potentials for the 3D and the 2D portions of the “gas” making sure to use the common energy baseline. Find the equilibrium point from the equilibrium of chemical potentials.

(b) The constant surface density condition simplifies computing the derivative  $dp/dT$  along the 2D/3D gas equilibrium using the result of part (a). In using the Clapeyron-Clausius equation, assume that the volume of the 2D portion of the gas is zero (or negligible) and there is no surface tension acting on it.

### 7.2 Boiling temperature of water

The problem is solved by straightforward application of the Clapeyron-Clausius equation.

### 7.3 3-spin Ising model

The problem is solved by straightforward application of the Gibbs distribution.