Seminar on problem solving in physics NFPL087, Wed 10:40, F052

Problem sheet 0

$\boxed{1}$ **Thermodynamics of a classical dipole**

A classical dipole moment $\vec{p}$ has a fixed magnitude $p = |\vec{p}|$; the moment directions are confined to a fixed plane ξ. The moment is under influence of an external electric field $\vec{E}$ at a temperature T; the field direction lies in the plane ξ. Consider the limit of low fields and high temperatures and calculate:

(i) the average value $\langle \vec{p} \rangle$ of the dipole moment,

(ii) the corresponding heat capacity (specific heat) C.