partikula bakarraren azterketa

$\Sigma(P)$ partikula bakarra (antzeko gas idealarena)

Σ antzeko gaitu $\boxed{\text{egoera-funtzioa}}$

partikula bakarrentzat

Kontuz ez gaudelako E energiaren espazioan
P momentuaren espazioan.

$$\Sigma(P) \approx \left[\frac{1}{h^3}\right] \int_{p \leq P} d^3q \, d^3p = \frac{1}{h^3} V \frac{4}{3}\pi P^3$$

eskuz sartutako faktorea

$p \to p + dp$

$$g(p) \equiv \frac{\partial \Sigma(p)}{\partial p} \quad . \quad g(p) = \frac{1}{h^3} V 4\pi p^2 \to \boxed{g(p) \cdot dp = \left(\frac{V}{h^3}\right) 4\pi p^2 \, dp}$$

$$E = \frac{1}{2}\frac{p^2}{m} \Rightarrow (2mE) = p^2$$

$$\boxed{p = (2mE)^{1/2}}$$

$$dp = \frac{1}{2} \frac{1}{(2mE)^{1/2}} \cdot (2m)^{1/2} \cdot dE$$

$\Sigma(E)$

$$\Sigma(E) \approx \left(\frac{1}{h^3}\right) V \cdot \frac{4}{3}\pi \left(2mE\right)^{3/2}$$

$E \to E + dE$

$$g(E) \equiv \frac{\partial \Sigma(E)}{\partial E} \qquad g(E) = \frac{1}{h^3} V \cdot 2\pi \left(2m^{3/2} E\right)^{1/2} \cdot dE$$

$$\frac{V}{h^3} 4\pi (2mE) \frac{1}{2} \frac{1}{(2mE)^{1/2}} (2m)^{1/2} \cdot dE$$

$$\frac{V}{h^3} 2\pi (2m)^{3/2} E^{1/2} \, dE$$