

Kittel TP

6.2. With  $\epsilon = \mu + \delta$ , involving Gibbs's distribution

$$f(\epsilon) = \frac{1}{\exp[(\epsilon - \mu)/\tau] + 1} = \frac{1}{\exp[\delta/\tau] + 1}$$

$$f(\mu - \delta) = \frac{1}{\exp[-\delta/\tau] + 1}$$

$$= \frac{\exp[\delta/\tau]}{\exp[\delta/\tau] + 1}$$

$$= \left[ 1 - \frac{1}{\exp[\delta/\tau] + 1} = 1 - f(\epsilon) \right]$$

$\Rightarrow$  Prob [orbital  $\delta$  above Fermi level is occupied]  
= Prob [orbital  $\delta$  below Fermi level is vacant]

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