FROM EQ. 5-25, 5-26 TO 5.27

5-25 → $\text{☁} = (i(\bar{k} \cdot \bar{x} - \omega t))$

(I) $f_e\, e^{\text{☁}}(-i\omega) + f_e \bar{v}\, e^{\text{☁}}[\hat{i}(k_1, k_2, k_3)] - \phi_e\, e^{\text{☁}}[\hat{i}(k_1, k_2, k_3)] \cdot \dfrac{\partial f}{\partial \bar{v}} = 0$

$\vec{k} \downarrow$

(II) $\phi_e\, e^{\text{☁}}[-1(k^2)] = 4\pi G\, e^{\text{☁}} \int f_e\, d^3\bar{v}$

(I) → $f_e = \dfrac{\phi_e \bar{k} \frac{\partial f_o}{\partial \bar{v}}}{\bar{k}\bar{v} - \omega}$

+ (II)

$$-k^2 \phi_e = 4\pi G \int \frac{\phi_e \bar{k} \frac{\partial f_o}{\partial \bar{v}}}{\bar{k}\bar{v} - \omega} d^3\bar{v}$$

$$k^2 \phi_e + 4\pi G \int \frac{\phi_a \bar{k} \frac{\partial f_o}{\partial \bar{v}}}{\bar{k}\bar{v} - \omega} d^3\bar{v} = 0$$

/ divide $k^2 \phi_e$

$$1 + \frac{4\pi G}{\cancel{4} k^2} \int \left(\frac{\bar{k} \frac{\partial f_o}{\partial \bar{v}}}{\bar{k}\bar{v} - \omega} \right) d^3\bar{v} = 0 \quad \rightarrow 5.27$$

dispersion relation