

Wave Excitation

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Shock Acceleration III

$$-V \partial I_{\pm} / \partial z = 2 \gamma_{\pm} I_{\pm}$$

$$I \cong I_{+} = I_{+}^{\circ}(k) + \frac{4\pi^2}{k^2} \frac{V_A}{V} |\Omega_p| m_p \cos \psi \int_{|\Omega_p/k|}^{\infty} dv v^3 \left(1 - \frac{\Omega_p^2}{k^2 v^2}\right) (f_p - f_{p,\infty})$$

$$f_{p,\infty} = \bar{n}_p (4\pi v_{p,0}^2)^{-1} \delta(v - v_{p,0}) + \bar{C} v^{-\gamma} S(v - \bar{v}_{p,0})$$

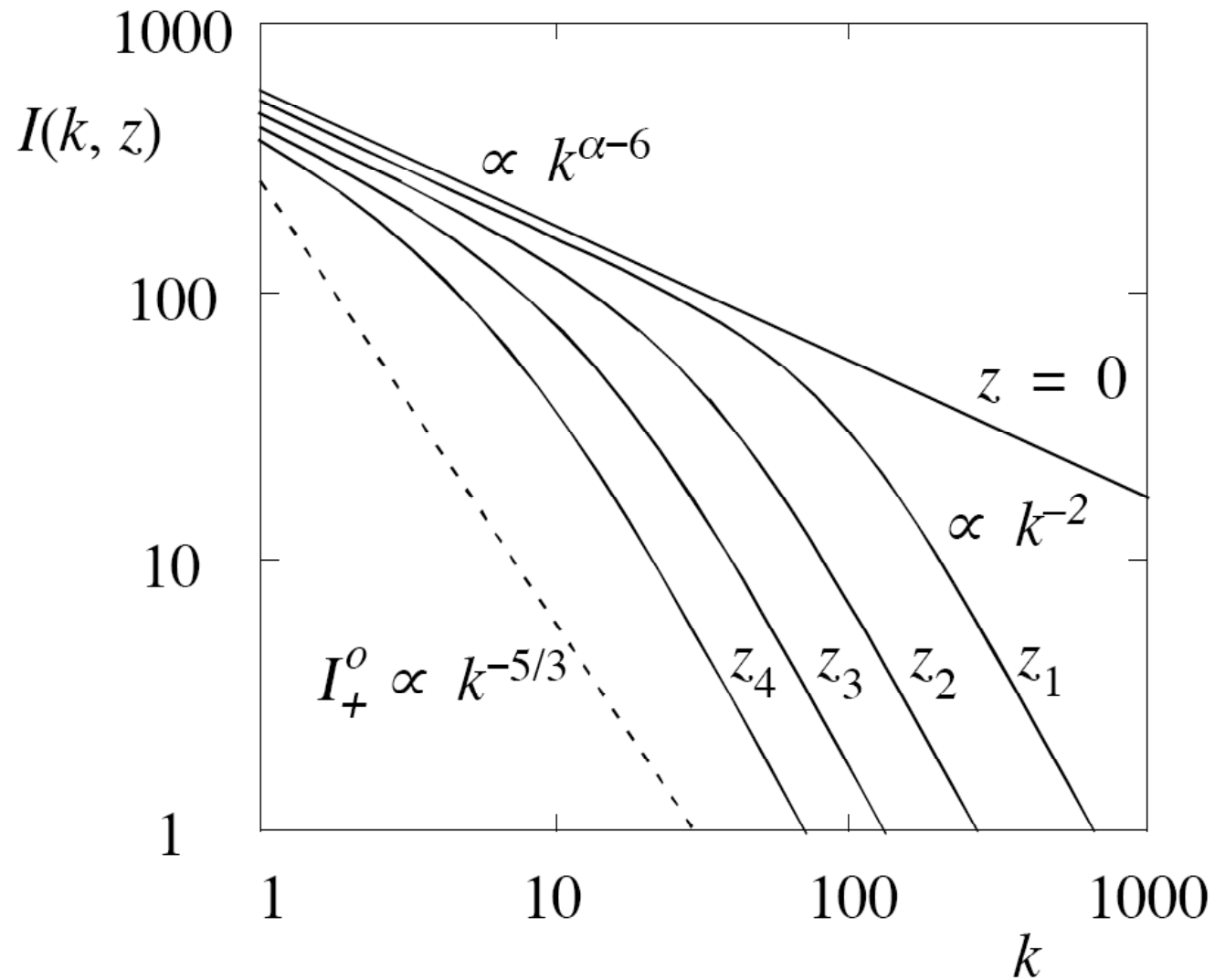
Shock Acceleration IV

$$I = I_{+}^{\circ} + \frac{4\pi^2}{k^2} \frac{V_A}{V} |\Omega_p| m_p \cos\psi \int_{|\Omega_p/k|}^{\infty} dv v^3 \left(1 - \frac{\Omega_p^2}{k^2 v^2}\right).$$

$$\cdot \left\{ \frac{\beta \bar{n}}{4\pi v_{0,p}^3} \left(\frac{v}{v_{0,p}}\right)^{-\beta} S(v - v_{0,p}) - \frac{\bar{n}}{4\pi v_{0,p}^2} \delta(v - v_{0,p}) \right. \\ \left. + \frac{\bar{C} \bar{v}_{0,p}^{-\gamma}}{\beta - \gamma} \left[\gamma \left(\frac{v}{\bar{v}_{0,p}}\right)^{-\gamma} - \beta \left(\frac{v}{\bar{v}_{0,p}}\right)^{-\beta} \right] S(v - \bar{v}_{0,p}) \right\}.$$

$$\cdot \exp \left\{ -V \int_0^z dz' \left[\cos^2\psi \frac{v^3}{4\pi} \frac{B_0^2}{\Omega_p^2} \int_{-1}^1 d\mu \frac{|\mu| (1 - \mu^2)}{I(\Omega_p \mu^{-1} v^{-1})} + \sin^2\psi K_{\perp} \right]^{-1} \right\}$$

Shock Acceleration V



Beta = 7, Gamma = 5.5, Psi = 0

R = 1E-2, IOBAR = 1E-3

