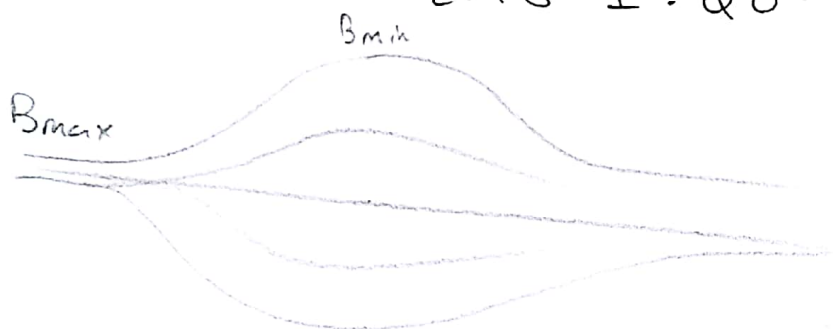


2013 I: Q6 GPP



$$w_{||0} + w_{\perp 0} = w_{||} + w_{\perp} \Rightarrow w_{||} = w_{||0} + N(B_{\min} - B)$$

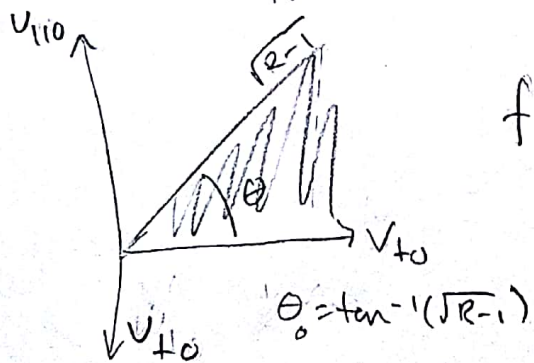
$$0 = w_{||0} + N(B_{\min} - B_{\max}) \text{ for last trapped particle}$$

$$w_{||0} = w_{\perp 0} \left(\frac{B_{\max}}{B_{\min}} - 1 \right)$$

$$\frac{w_{||0}}{w_{\perp 0}} = \frac{B_{\max}}{B_{\min}} - 1 = R - 1$$

where $R \equiv \frac{B_{\max}}{B_{\min}}$

Fraction trapped: $\frac{\# \text{ with } \frac{v_{||0}}{v_{\perp 0}} < \sqrt{R-1}}{\# \text{ total}}$

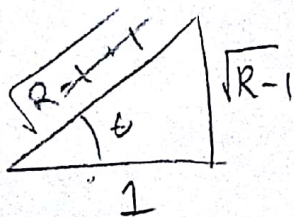


$$f = \frac{\int_0^{2\pi} d\theta \int_0^{\infty} r^2 dr \int_{\pi/2+\theta_0}^{\pi/2-\theta_0} \sin\phi d\phi}{\int_0^{2\pi} d\theta \int_0^{\infty} r^2 dr \int_0^{\pi} \sin\phi d\phi} = \frac{\cos(\frac{\pi}{2}-\theta_0) - \cos(\frac{\pi}{2}+\theta_0)}{-(1-(-1))}$$

$$f = -\cos(\frac{\pi}{2} - \theta_0) = \sin(\theta_0)$$

$$f = \sin(\tan^{-1}(\sqrt{R-1}))$$

$$f = \frac{\sqrt{R-1}}{\sqrt{R}}$$



$$f_T = \sqrt{1 - \frac{1}{R}}$$

