Class Thursday 30 March

Repair estimate of $f_K : f_\mu$ for a plane P wave:

$s_x = s_y = 0$ 

$s_z = A \cos(kz - \omega t)$

$\varepsilon_{zz} = \partial_z s_z$

$d_{xx} = d_{yy} = -\frac{1}{3}\varepsilon_{zz}$

$d_{zz} = \frac{2}{3}\varepsilon_{zz}$

$f_K \sim K \varepsilon_{zz}^2$

$f_\mu \sim 2\mu (d_{xx}^2 + d_{yy}^2 + d_{zz}^2)$

$= 2\mu \left(\frac{1}{9} + \frac{1}{9} + \frac{4}{9}\right) \varepsilon_{zz}^2$

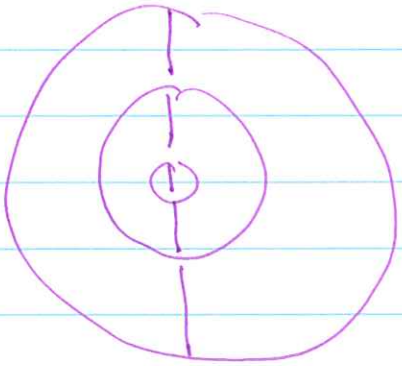
$= \frac{4}{3}\mu \varepsilon_{zz}^2$

$f_K : f_\mu = K : \frac{4}{3}\mu \approx \frac{5}{3}\mu : \frac{4}{3}\mu \approx 5 : 4$

i.e. $f_K = \frac{5}{9}$, $f_\mu = \frac{4}{9}$ in Poisson solid

~~Poisson mode~~

PKIKP mode



$$f_k = \frac{\frac{5}{9} T_{PcP} + T_{KiK} + \frac{5}{9} T_I}{T_{PKIKP}}$$

$$f_\mu = \frac{\frac{4}{9} T_{PcP} + \frac{4}{9} T_I}{T_{PKIKP}}$$

PcP at $\Delta = 0$: 8m 31s = 511 s

PKIKP at $\Delta = \pi$: 20m 12s = 1212s

$$T_I \approx \frac{2434 \text{ km}}{11 \text{ km/s}} \approx 221$$

$$f_\mu \approx \frac{\frac{4}{9}(511 + 221)}{1212} = 0.27$$

Then do transami modes & atmospheric modes

Then do excitation by a transient source Sect 4.1.8

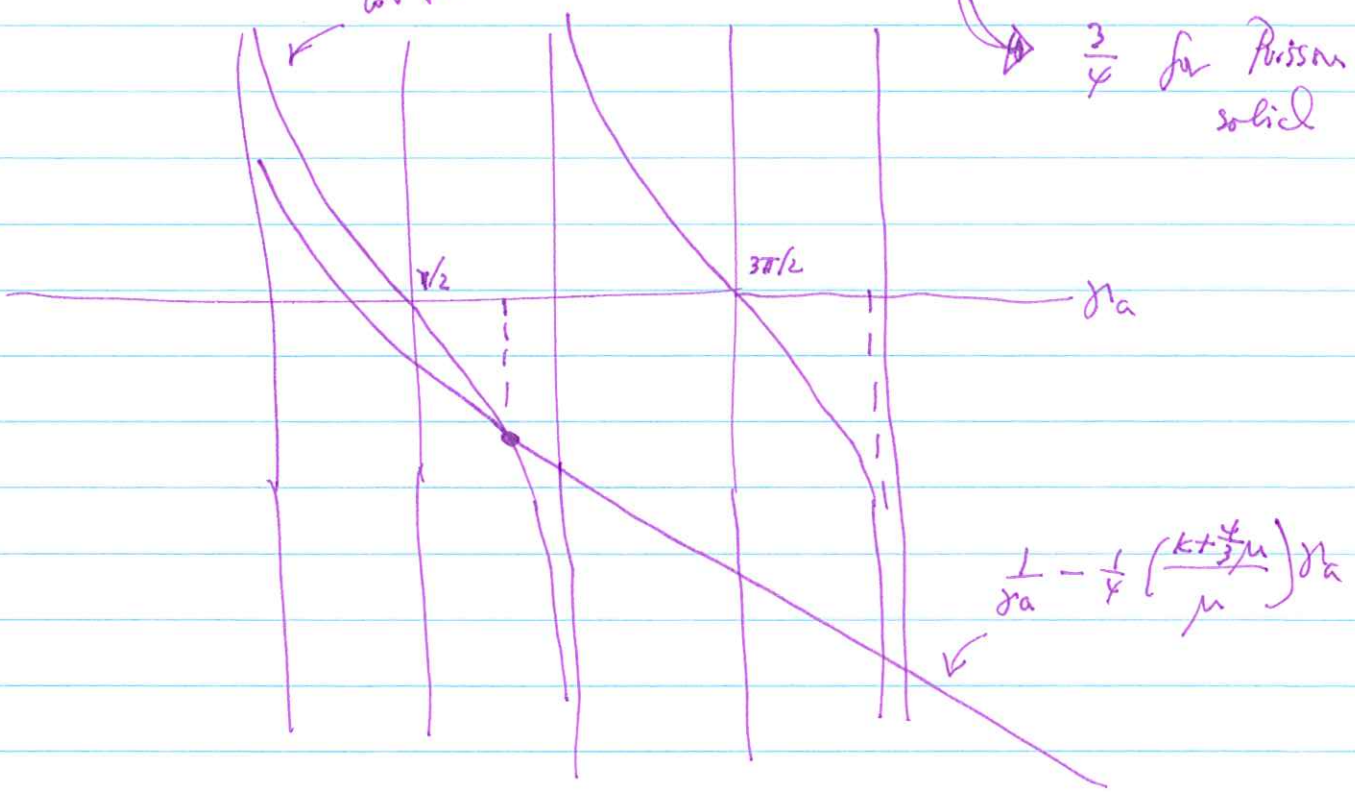
Then do stress glut Ch. 5

Moment tensor representation Sect. 5.4

Radial Mode : homogeneous sphere

$$\cot(\gamma a) = \frac{1}{\gamma a} - \frac{1}{4}\left(\frac{\kappa + \frac{4}{3}\mu}{\mu}\right)\gamma a$$

$\frac{3}{4}$ for Poisson solid



$$_0\gamma_0 a = 0.82\pi$$

$$_1\gamma_0 a = 1.98\pi$$

} Poisson solid $\kappa = \frac{5}{3}\mu$

Fluid sphere ($\mu = 0$) at $\gamma a = -\infty$

$\Rightarrow$

$$_n\gamma_0 a = (n+1)\pi$$

$$_n\omega_0 = \sqrt{{}_n\gamma_0^2 \alpha^2 - \frac{16}{3}\pi G\rho}$$