

Now,  $L^2 c^{-2} u^2 = v^2/c^2$  since  $L = r v$

$\therefore \{1 - u F''(u)/F'(u)\} = 1 - 6 \frac{v^2}{c^2} + O\left(\frac{v^4}{c^4}\right)$

and  $1/g = \{1 - u F''(u)/F'(u)\}^{-\frac{1}{2}}$

$= 1 + 3 \frac{v^2}{c^2} + O\left(\frac{v^4}{c^4}\right)$

$\therefore \Theta_p = 2\pi/g = 2\pi + 6\pi \frac{v^2}{c^2}$

$\Rightarrow$  precession/turn  $= 6\pi \frac{v^2}{c^2}$  radians

Let us 1<sup>st</sup> compute precession for earth

$\frac{v}{c} = \frac{v \times 1 \text{ yr}}{c \times 1 \text{ yr}} = \frac{\text{length of orbit}}{1 \text{ ly}} = \frac{2\pi \times .93 \times 10^8}{5.88 \times 10^{12}}$

$= .9937 \times 10^{-4}$ ,  $\left(\frac{v}{c}\right)^2 = .988 \times 10^{-8}$

$\therefore$  precession/century  $= 6\pi \times 10^2 \times .988 \times 10^{-8}$  rad

$2\pi \text{ rad} = 360^\circ$ ,  $6\pi \text{ rad} = 3 \times 360^\circ$

precession/cent  $= 3 \times 360 \times 10^2 \times .988 \times 10^{-8} \times 60 \times 60 \text{ sec/cent}$

$= (3 \times 36 \times 6 \times 6) \times .988 = 3.84 \text{ sec/cent}$