1 The static solution

The Cauchy stress in the current configuration is diagonal, and has the form

$$\mathbf{T} = T_{rr}\mathbf{e}_r \otimes \mathbf{e}_r + T_{\theta\theta}\mathbf{e}_\theta \otimes \mathbf{e}_\theta. \tag{1}$$

The radial and annular components depend only on r, and are given, respectively, by

$$T_{rr} = G\frac{r_0^2}{r^2} - p, \qquad \text{and} \qquad T_{\theta\theta} = G\frac{r^2}{r_0^2} - p. \tag{2}$$

The unknown pressure p is determined by observing that the equilibrium equation in the radial direction

$$\frac{dT_{rr}}{dr} + \frac{T_{rr} - T_{\theta\theta}}{r} = 0 \tag{3}$$

does not involve p. This equation can be integrated using the condition $T_{rr}(r_1) = 0$ to obtain

$$T_r = -\frac{G}{2}\left(\frac{r_0^2}{}\right) \tag{4}$$

Consider a rectangular strip Ω rolled up along around a disk with its top and bottom ends joined to form a loop, so that in the deformed configuration the strip occupies an annular region ω on the plane, as shown in the figure.

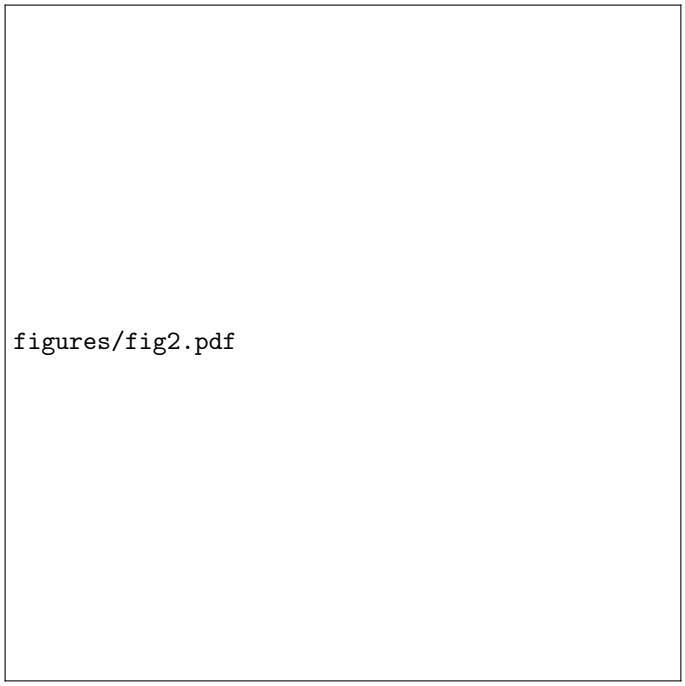

Figure 1: inserire figura qui.