Timoshenko formula for u_theta evaluated for: r=a and theta

$u0 := -.01 \quad E := 10000. \quad a := 5. \quad b := 10. \quad nu := .25 \quad r := a$

$$k := \left(\frac{1}{2}\right)(1 - 3nu)\,a^2 - b^2\left[\frac{(1 + nu)}{2}\right] - \left(a^2 + b^2\right)\cdot(1 - nu)\cdot\ln(a) \qquad k = -210.259804291$$

$$n := a^2 - b^2 + \left(a^2 + b^2\right)\ln\left(\frac{b}{a}\right) \qquad n = 11.64339757$$

$$p := \frac{-(u0\cdot E\cdot n)}{\pi\left(a^2 + b^2\right)} \qquad p = 2.964966844$$

$$th := 0, \frac{1}{49} .. 1 \qquad thr(th) := (th)\cdot\frac{\pi}{2} \qquad c(thr) := \cos(thr) \qquad s(thr) := \sin(thr)$$

$$ur(thr) := \left(\frac{p}{n\cdot E}\right)\cdot\left[\left[\left(\frac{1}{2}\right)\cdot(1 - 3nu)\cdot r^2 - a^2\cdot b^2\cdot\frac{(1 + nu)}{2\cdot r^2}\right] - \left(a^2 + b^2\right)\cdot[(1 - nu)\cdot\ln(r)] - k\right]\cdot s(thr) + \left[\left(a^2 + b^2\right)\cdot(2\cdot thr - \pi)\right]\cdot c(thr)\right]$$

$$ut(thr) := -\left(\frac{p}{n\cdot E}\right)\cdot\left[\left[\left[\left(\frac{1}{2}\right)\cdot(5 + nu)\cdot r^2 - a^2\cdot b^2\cdot\frac{(1 + nu)}{2\cdot r^2}\right] + \left(a^2 + b^2\right)\cdot[(1 - nu)\cdot\ln(r) + (1 + nu)] - k\right]\cdot c(thr)\right]\right]$$

$$utl(thr) := ut(thr) + \left(\frac{p}{n\cdot E}\right)\cdot\left[\left[\left(a^2 - b^2\right)\cdot(2\cdot thr - \pi)\right]\cdot s(thr)\right]$$