4.5 Axially compressed cylinder

REFERENCE	Simo et al. [4-4]
KEYWORDS	shell elements, solid elements, layered solid elements
MODEL FILENAME	Buckling05.nfxa

Figure 4.5.1 shows a cylindrical shell model under distributed compressive load. Both ends of the cylinder are clamped in transverse direction. One eighth portion of the cylinder is modeled with symmetric boundary condition. The linear buckling analysis is carried out to determine the lowest critical load factor. The typical mode shape is sketched in Figure 4.5.2.

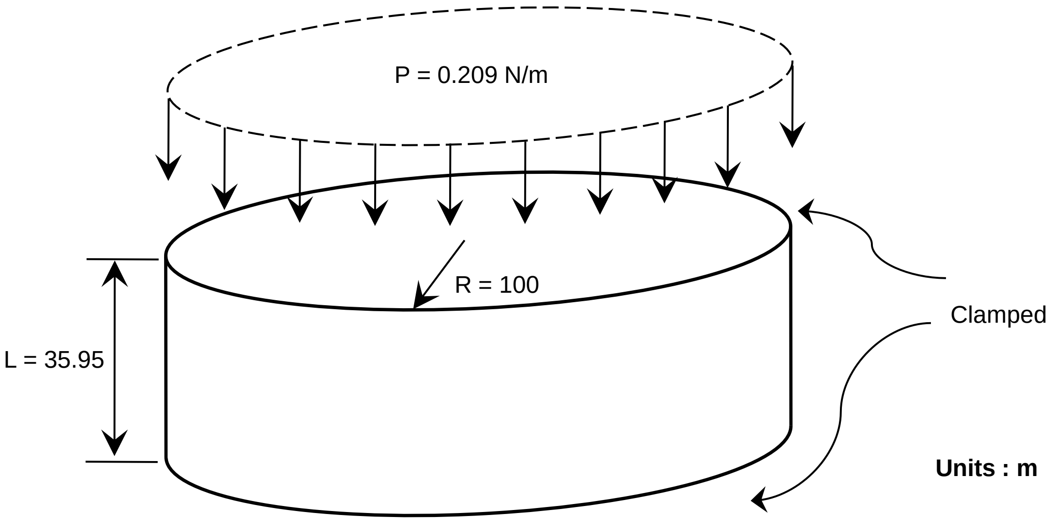

Figure 4.5.1 Axially compressed cylinder model

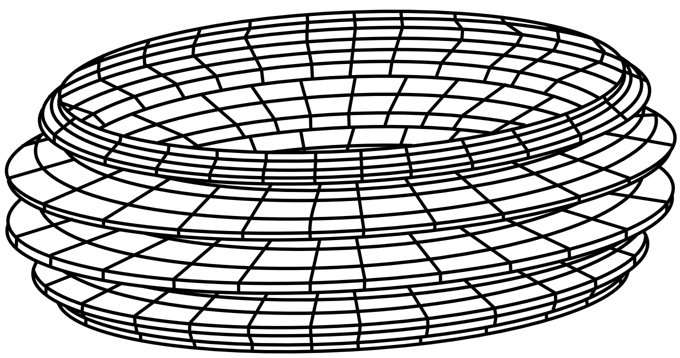

Figure 4.5.2 Buckling mode shape

Material data	Young's modulus Poisson's ratio	$E = 567\ Pa$ $\nu = 0.3$
Section property	Thickness	$t = 0.247\ m$

Table 4.5.1 Critical load factor obtained using shell elements

Reference		*1.0833*
Element type	Number of elements	
TRIA-3	840	*1.1094*
QUAD-4	420	*1.1370*
TRIA-6	840	*1.0104*
QUAD-8	420	*1.0198*

Table 4.5.2 Critical load factor obtained using solid elements

Reference		*1.0833*
Element type	Number of elements	
HEXA-8	420	*1.0608*
HEXA-20	420	*0.9935*

Table 4.5.3 Critical load factor obtained using layered solid elements

Reference		*1.0833*
Element type	Number of elements	
HEXAL-8	420	*1.0691*
HEXAL-20	420	*0.9917*