

Student: Juan Diego Iberico Leonardo

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Assignment 9: Shells Revolution

1) Describe in extension how can be applied a nonsymmetric load on this formulation.

In order to be applied a nonsymmetric load, first it is necessary expand the loads in Fourier series (using the same harmonic functions as the displacement) along the circumferential direction. From that decomposition, one can compute separately the symmetric and anti-symmetric solutions.

2) Using thin beams formulation, describe the shape of the $B^{(e)}$ matrix and comment the integration rule.

In principal one can use both formulation for beams (Kirchhoff and Reissner-Mindlin), but not considering the effect of transverse shear deformation for thick beams due to the small dimension of the shell thickness.

The matrix B, it is divided in tow main fields, arising one for membrane effect and the other for bending effect.

As a remark, for the integration rule, it should be considered to avoid the integration form the axis of rotation due to it will drive to infinite components on the B matrix. As a solution, the integration should be done at the interior of the elements (gauss point).