

# Assignment 8

Nadim Saridar

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In the given of this assignment, one should analyse a concrete hyperbolic shell due to its selfweight, and fixed on the sides. To do so, the hyperbolic shell was modeled with a triangular structured mesh and each side has 9 elements (Figure 1).

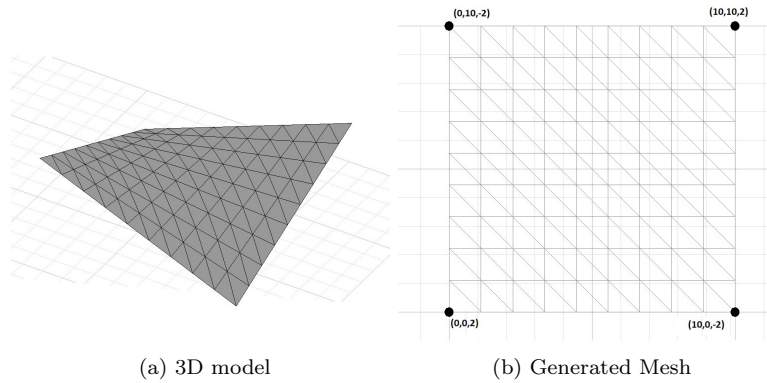


Figure 1: Given of the Problem

The programs used are GiD and Matlab connected through the MatFem codes downloaded from the CIMNE website. The following results were obtained:

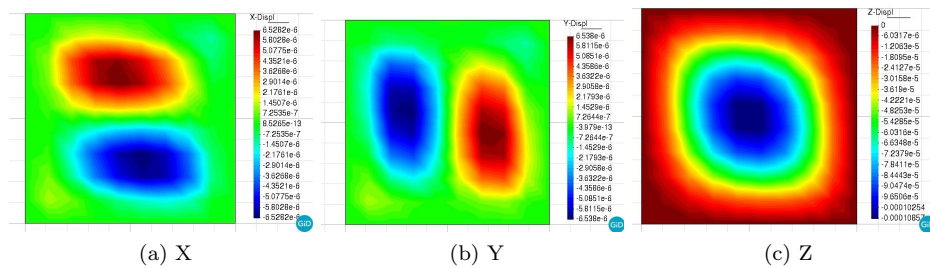


Figure 2: Displacements

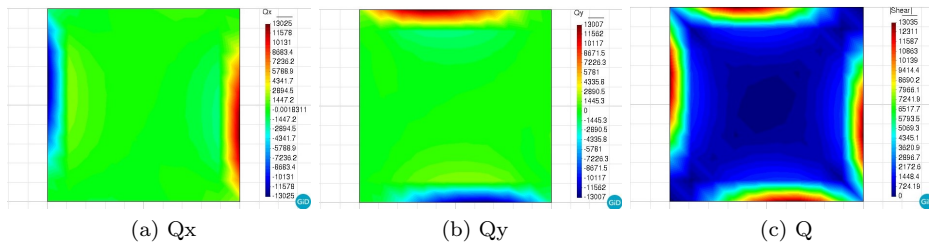


Figure 3: Shear Stress

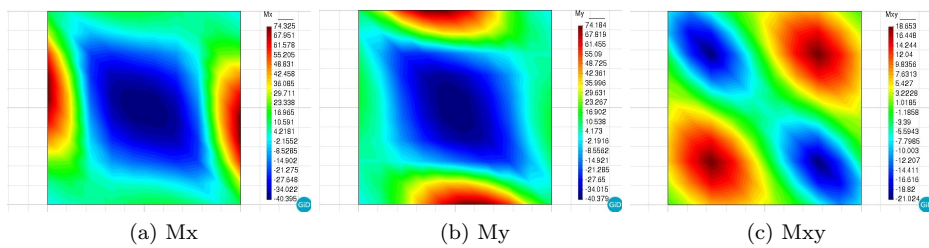


Figure 4: Bending Moments

One can notice from the shear stresses (Figure 3), that all the shear is present at the boundaries, and this is expected because it is a property of a hyperbolic shell, and this is why it is used to build roofs, like the ones we see on stadiums.

On the other hand, looking at figures 2 and 4, we can notice that shells act just like beams in each direction (X and Y directions) that have uniform downward loads (in this case the self weight).