# ELEC-E4450 Antennas, spring 2022, homework 9

Return your written contribution **by Tuesday, 17 May at 20 in MyCourses**. The review takes place on **Friday, 20 May at 10** during the contact session. The score of this exercise is equal with other exercises.

This exercise is related to the Starlab radiation pattern measurements on Friday, 6 May. Find the measurement results as two text files in MyCourses. The files contain the partial realized gain components (dBi) of vertical (theta) and horizontal (phi) polarizations as a function of the elevation (theta) and azimuth (phi) angle at 1.5-GHz frequency. Note that the definition of the coordinate system of the Starlab system differs from the standard coordinate system, see the figure on the right. You may use the Starlab coordinate system directly or convert the results to the standard coordinate system. Additionally, a couple of photos of the measurement campaign are at your disposal in MyCourses.
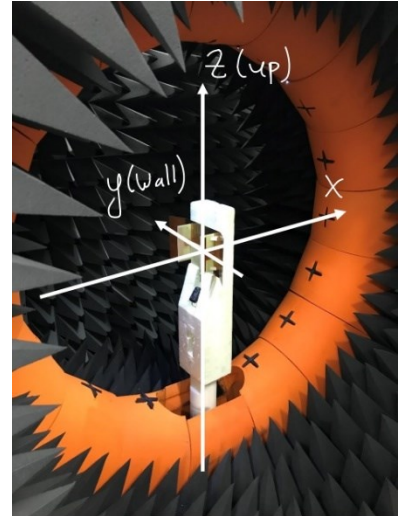
Your task is to handle, present and analyze the measurement results. This is to say, present a suitable subset of the full-3D radiation pattern, for example, two principal pattern cuts as realized gain (dBi) so that the radiation features of the antenna are clearly visible. Analyze the results as well, for instance, discuss any insight that can be seen and learnt from the radiation features of the antenna.

Pay attention to the following factors – i.e., they add up to the total points of the exercise.

- The orientation of the antenna in the used coordinate system is clearly shown.
- It is clearly stated which pattern-related quantity (including the used unit) and principal pattern cuts are shown.
- The plots of the radiation patterns are stylish-looking – i.e., they are plotted with Matlab, Mathematica or equivalent. (Excel-plotted curves are not typically appreciated by the scientific community.)
- The plots are clear, for example, the direction and width of the main lobe is clearly visible.
- The labels and scaling of the coordinate axes are reasonable.
- Preferably, there is an authentic photo of the measurements.
- The main results are explained, possible further analysis is also given.

If you need any help, do not hesitate to contact the teachers (e.g., Jan Bergman), or ask during the contact session, for instance, on Friday, 13 May.