Z

X

(0,0,0)

Y

(-0.935,-3.679,-0.744)

Units: meters

Homework 4, Data adjustment 2, analysis of terrestrial laser scan data, assigned 23-mar-09 due 3-apr-09

- Find data in "crop2.txt" in ftp-site, XYZ
- See "crop2.dwg" for visualization
- Data in meters, origin as shown in sketch
- Approximate radius 68 cm
- Fit a sphere by sequential LS to the data
- Form normal equations one point at a time

- In the spirit of sequential LS you should use fopen, fscanf, and fclose to read and process the points one at a time, then do again for each iteration, however you may take short cut and load 59,147 points as usual
- Check convergence, report sphere parameters, sigma-0, rms of vx, vy, vz, and largest magnitude of vx, vy, vz
- How do these numbers compare with manufacturer's specs for precision?
- Hints – this is a general LS problem, but let's linearize always at original obs.
- From Photo-1 what is the focal length of a sphere, and therefore what is the focal length of this antenna?
- How else could you solve a problem like this if you did not have a laser scanner?