

Subject: Survey results of s-band rx and tx horns
From: Lynn Baker <lab5@cornell.edu>
Date: 11/19/2012 11:25 AM
To: Mike Nolan <nolan@naic.edu>
CC: Phil Perillat <phil@naic.edu>, Denis Urbain <durbain@naic.edu>

Hi Mike,

Its been a little slow getting this out. The old software needed a complete rewrite and checking which took a while. It is now up to date, better organized and better documented. When I finish the rest of the data reduction I will polish up the documentation and provide the Mathematica script as both software and as documentation of the data reduction process.

Attached is a short document summarizing the results of surveying the s-band horns on Oct. 31. The results are about what we discussed right after the survey. The largest error being the receive horn is too low by roughly an inch. This better analysis shows that the x error of the receive horn is too close to the secondary and the turret rim. Lifting the horn to eliminate the focus error will move it a bit away from the secondary, making the x error smaller. Fixing the x tilt error will also move the mouth of the horn away from the secondary, again reducing the x translation error. The tilt errors are pretty small, I am not sure if fixing them is worth the trouble. It may not be necessary to relocate the floor beam to increase the x translation motion. It may be sufficient to cut the floor plate to allow the lift in z.

The transmit horn has some errors, mostly a ~.5" error in x and a ~1 degree error in x tilt. When we were first discussing the receive horn results we were comparing it to the transmit horn and the .5" error in the transmit horn position effected our early conclusion about the required motion of the receive horn.

I compared the results of the analysis using the the secondary reference used during the survey and a reference drawn from the June 28, 2004 videogrammetry. The details are in the document but the conclusion is that changing the reference set does not move the survey results very much so this is not an issue. This is not very surprising given that we shoot a large set of targets for the reference set which averages down the errors. This also suggests that developing an amplitude weighted fit of the videogrammetry data won't change the coordinate system definition very much.

I will proceed to reduce the data from surveying the other horns and send along those results. Then I will turn to finishing the documentation of the survey process as well as writing the overview documents.

Regards,
Lynn

— Attachments:

data_analysis_summary.rtf

3.2 KB