



Hartebeesthoek Footprint Survey-Epoch August 2007

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PROJECT INTRODUCTION

- ◆ The project was a **continuation** of the HartRAO Footprint surveys
- ◆ Period August 2007
- ◆ The aim of this project was to determine whether any **instability** in the surrounding area occurred since the last surveys
- ◆ The GPS base station **HRAO** (an IGS station) was used as reference point.
- ◆ Single frequency **Trimble receivers** were used to occupy beacons fixed to bedrock
- ◆ Part of National Diploma (DUT) experiential training

DATA CAPTURING

- ◆ Roving receiver was set up at one station per day for a minimum of eight hours .
- ◆ Ashtech (ZXII) was used as permanent GPS receiver, which logged data continuously throughout the duration of all sessions.
- ◆ Elevation horizon was set to 15 deg
- ◆ Sampling rate 30 seconds
- ◆ Antenna L1 compact dome (antenna model used during processing)

FIELD EQUIPMENT

- ◆ Trimble 4000 SE GPS Receiver.



- ◆ Trimble Compact Dome L1 GPS Antenna.



- ◆ Steel Forced-Centring base plate



SURVEY DATA USED

- ◆ The coordinates used are based on the **World Geodetic System 1984 (WGS84)**.
- ◆ The position of HRAO was not set to ITRF coordinates as determined by the International Earth Rotation Service (IERS) as only **relative vectors** were required.

DATA PROCESSING

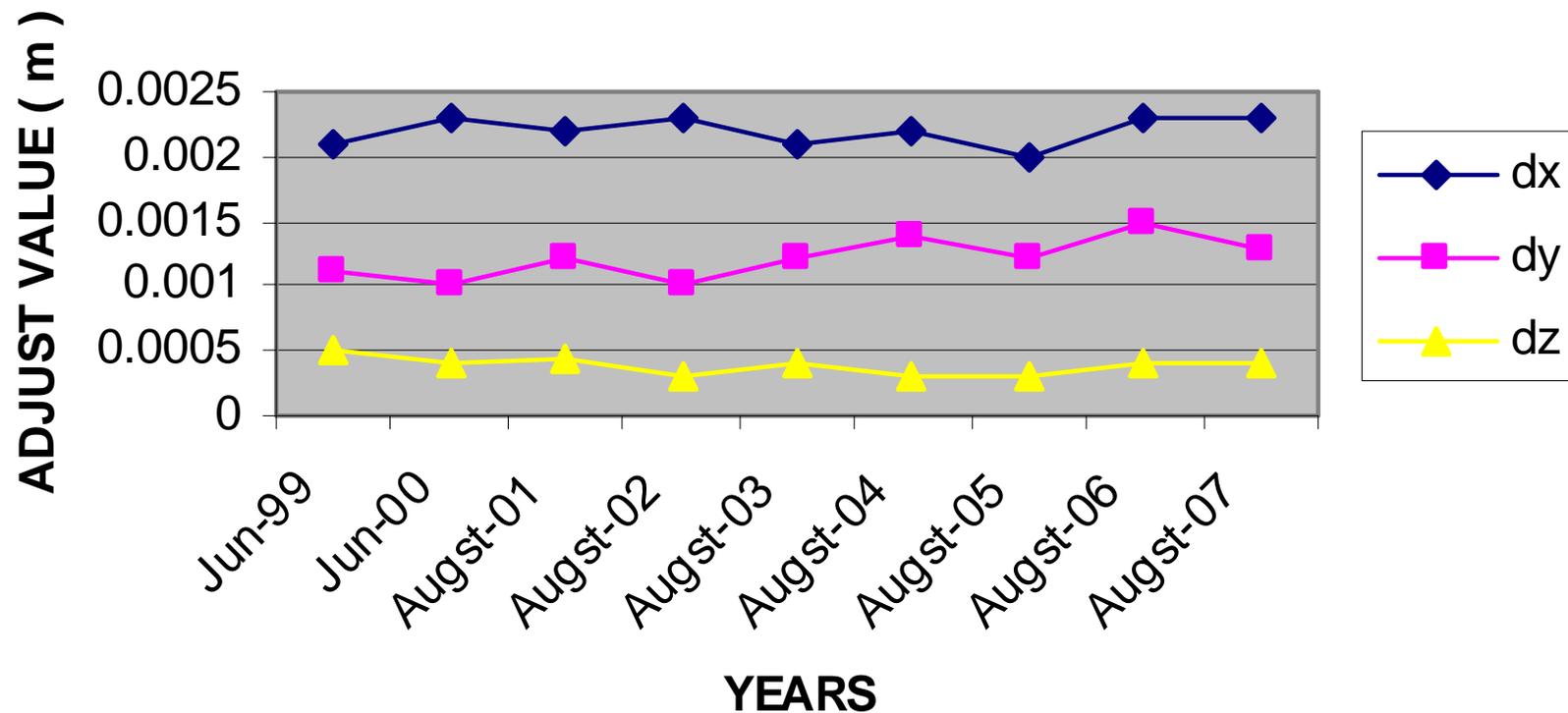
- ◆ GPS data post-processing was done using the **Weighted Ambiguity Vector Estimator (WAVE)**.
- ◆ Using the editing function, only the radial baselines from the IGS station-HRAO to the control points **B44, 411, 412, 413, 414, 415, 418** were enabled for processing in order to compute sets of baseline solutions (**L1 FIXED**).

RESULTS AND ANALYSIS

- ◆ The results were comparable to the previous surveys and gave acceptable **L1 FIXED** solutions for all baselines.
- ◆ The **Ratios** for the radial baselines were all well above **1.5** with the minimum value of **21.2**.
- ◆ The **Reference Variances** were all below **10** and nearly evenly distributed between a minimum of **0.772** and a maximum of **7.833**. The **Root Mean Square errors (RMS)** were within **0.003** to **0.010**.

COMPARISON OF THE COMPONENT

Representation of X, Y , Z Delta COMPONENT



CONCLUSIONS

- ◆ All beacons are located well away from reflective surfaces, which could introduce multipathing. The results from computations are well within acceptable standards of accuracy for this type of survey (error).
- ◆ Comparison between the two previous surveys and this survey indicates a highly stable site as the differences are within the expected variation and accuracies of the results.



THANK YOU !!!

