521 M7410 –Adjustment and Analysis of Spatial Information

Fall Semester 2015

Homework No. 6

handed out Thursday, November 05, 2015
due Thursday, November 12, 2015, 09:10 **Name:** _____

General Least-squares Adjustment

1. Redo Homework No. 5 part 1, but now assuming that both $\boldsymbol{p},\boldsymbol{q}$ and $\boldsymbol{P},\boldsymbol{Q}$ are observables with random errors. For $\boldsymbol{p},\boldsymbol{q}$, $\sigma_l = \pm 0.5\boldsymbol{cm}$; for $\boldsymbol{P},\boldsymbol{Q}$, $\sigma_l = \pm 5.0\boldsymbol{cm}$. All observables are uncorrelated.

   1) Find LSQ estimates of all parameters and observables.
   2) Compute $\hat{\sigma}_0$, $\sum_{\Delta\Delta}$, $\sum_{\boldsymbol{w}}$, and $\sum_{\hat{\boldsymbol{l}}\hat{\boldsymbol{l}}}$.

2. Discussions (comparison of your answer against that in Homework 5).

3. Again, can you apply the general least-squares approach to the problem described in HW00? If positive, how?

Your (individual) final report should contain (use A4 papers):

- this page as the cover sheet
- source code(s) and outputs; do not forget to add your name and lots of comment cards to the source listing (% .....)
- input and output files from program [input/output values used and calculated], if any
- plots, including captions on axes, title, your name, LB#/HM#, course title, date (if any)
- derivation and description of formulas used, accompanied by figures where applicable
- evidence of computational accuracy
- discussion of results