

Data Adj. 1, Homework 5

7 parameter transformation, General LS, due Wed, Mar 30

1. Make the LS adjustment via general LS using the model,

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \lambda M \begin{bmatrix} X \\ Y \\ Z \end{bmatrix} + \begin{bmatrix} t_x \\ t_y \\ t_z \end{bmatrix} \quad ; \quad M = M_K M_\phi M_\omega$$

use initial approximations,

$$\lambda = 1.9 \quad t_x = 18$$

$$\omega = 4^\circ \quad t_y = 31$$

$$\phi = 9^\circ \quad t_z = 40$$

$$K = 16^\circ$$

for the following data observed in X, Y, Z and $\underline{X}, \underline{Y}, \underline{Z}$,

	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
1	23.76	31.36	44.53	1.99	0.99	2.08
2	23.17	31.92	48.39	2.06	0.99	3.92
3	22.55	32.40	52.26	1.99	1.02	6.02
4	24.71	35.22	44.17	1.97	2.98	2.00
5	24.28	35.77	47.95	1.95	3.05	4.02
6	23.71	36.24	51.95	2.00	3.08	6.00
7	27.57	30.50	45.03	4.01	1.02	1.98
8	26.92	30.88	49.05	4.11	1.02	4.05
9	26.36	31.43	53.02	4.02	0.92	6.02
10	28.63	34.24	44.75	4.02	3.05	2.05
11	28.08	34.79	48.75	3.93	3.05	4.00
12	27.52	35.22	52.61	4.02	3.06	6.05

$$\sigma = 0.05$$

(all observations)

2. make global test @ $\alpha = 0.01$

3. plot 90% confidence ellipse for (t_x, t_z)
 plot 90% confidence circle for (t_x, t_z)