

39-1

1. analysis: n, n_0, r
 show condition equation

2.
$$\left. \begin{aligned} V + B\Delta = f \\ C\Delta = g \end{aligned} \right\} \text{ in newton iteration loop}$$

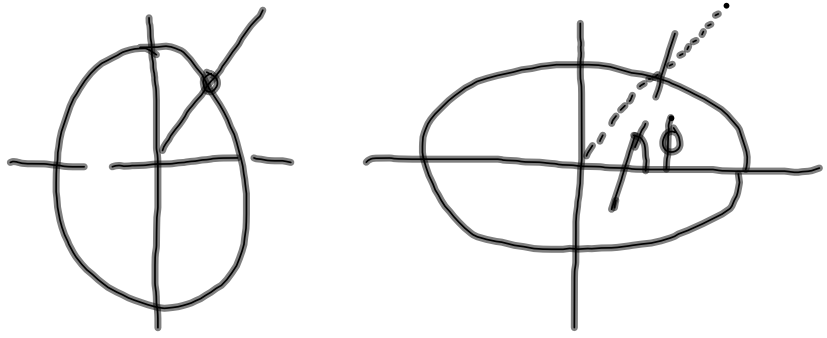
$$\begin{pmatrix} N & C^T \\ C & 0 \end{pmatrix} \begin{pmatrix} 0 \\ k_c \end{pmatrix} = \begin{pmatrix} -f \\ g \end{pmatrix}$$

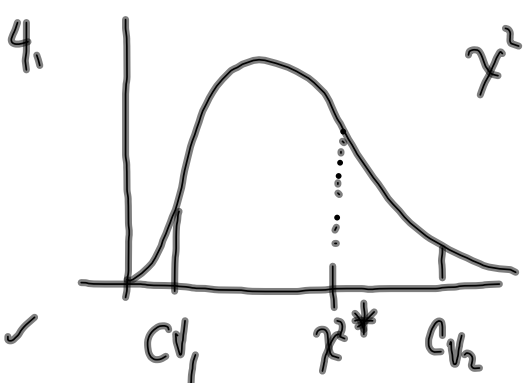
$$\begin{pmatrix} x \\ y \\ z \\ dt \end{pmatrix}_{\text{new}} = \begin{pmatrix} x \\ y \\ z \\ dt \end{pmatrix}_{\text{curr}} + \Delta$$

next iteration

Nov 28-9:22 AM

39-2

3. 

4. 
$$\chi^2_* = \frac{V^T W V}{\sigma_0^2}$$

compression

\checkmark $\alpha/2$ P P_{χ^2} P $1 - \alpha/2$

Nov 28-9:23 AM

5. neglected ionosphere correction 39-3
6. converge $[0, 0, 0, 0]$
7. show residuals
8. INWL, PRDU (3.4 km)

	<u>INWL</u>	<u>PRDU</u>	
(m)	29.07	29.02	.05
	-26.06	-26.29	.23
	44.47	44.17	.30

Nov 28-9:23 AM

<u>V_{INWL}</u>	<u>V_{PRDU}</u>	errors not random ³⁹⁻⁴ ⇒ systematic
.01597	.01565	
-.00779	-.00792	
.03232	.03245	
.01971	.01968	
.00165	.00195	
-.03187	-.03174	
-.02437	-.02456	
-.00561	-.00552	

Nov 28-9:23 AM

$$\underline{N_i = N_{i-1} + B_i^T W_i B_i}, \quad t_i = t_{i+1} + B_i^T W_i f_i \quad 39-5$$

applied S.M. lemma

$$\Delta_i = N_i^{-1} t_i$$

↑
multiply out

$\Delta_i = 4$ terms

got expression for last term

Nov 28-9:23 AM

$$\Delta = N_{i-1}^{-1} t_{i-1} \quad (\Delta_{i-1}) \quad 396$$

$$+ N_{i-1}^{-1} B_i^T W_i f_i$$

$$- N_{i-1}^{-1} B_i^T (Q+J)^{-1} B_i \overbrace{N_{i-1}^{-1} t_{i-1}}^{\Delta_{i-1}}$$

$$+ N_{i-1}^{-1} B_i^T (J+Q)^{-1} f_i \left[- N_{i-1}^{-1} B_i^T W_i f_i \right]$$

$$\Delta = \Delta_{i-1} - \underbrace{N_{i-1}^{-1} B_i^T (Q+J)^{-1} B_i}_{\Delta_{i-1}} \Delta_{i-1} + \underbrace{N_{i-1}^{-1} B_i^T (Q+J)^{-1} f_i}_{\Delta_{i-1}}$$

Nov 28-9:23 AM

$$\Delta_i = \Delta_{i-1} + \underbrace{N_{i-1}^{-1} B_i^T}_{\pm} \underbrace{(Q_i + B_i N_{i-1}^{-1} B_i^T)^{-1}}_{\pm} (f_i - B_i \Delta_{i-1}) \quad 39-7$$

$$N_i = N_{i-1} + B_i^T W_i B_i \quad \text{adding } \xi, \text{ deleting}$$

$$N_i^{-1} = \dots$$

given $\Delta_{i-1}, N_{i-1}^{-1}$ + new obs B_i, W_i, f_i
 can update to Δ_i, N_i^{-1}

Nov 28-9:23 AM

$(\quad)^{-1}$
 ↑
 single equation \Rightarrow scalar

39-8

Nov 28-9:23 AM