Lecture 43   spy (·)   43-1

more Hw7
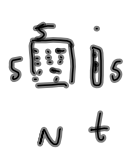
A: 30   30   30   B   5   5   5   N   t

$AQA^T = Q_e$ ..

W, Q

$N_i = N_{in} + b_i^T (a_i q_i a_i^T)^{-1} b_i$

$t_i = t_{i-1} + b_i^T (a_i q_i a_i^T)^{-1} f_i$

Phys. model $\dfrac{w_1^2}{a^2} + \dfrac{w_2^2}{b^2} = 1$
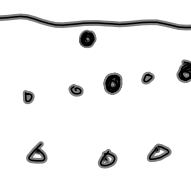
Polyn model $Ax^2 + Bxy + \cdots = 0$
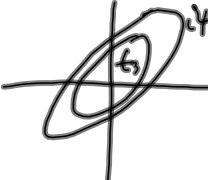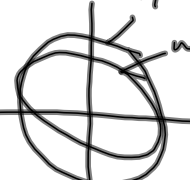
Phys cond (N) ~ 500

Polyn cond (N) ~ 10^9

$K = \dfrac{\text{rel. error in } x}{\text{rel. error in } t}$ $N_x = t$ 43-2

(cond #)

constraint,
w/o

w

lect.

$Q_{bb} = N^{-1}\left(I - C^T \left(C N^{-1} C^T\right)^{-1} C N^{-1}\right)$

N full rank = invertible = non singular

$Q_{bb} = -\alpha \,, \quad \begin{bmatrix} N & C^T \\ C & 0 \end{bmatrix}^{-1} = \begin{bmatrix} \alpha & B^T \\ B & \gamma \end{bmatrix}$

N not full rank, not invert., singular

Convergence 43-3

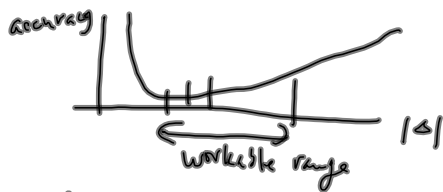|	
10^{-1}	10^{-1}
10^{-2}	10^{-3}
10^{-3}	10^{-5}
10^{-4}	10^{-7}
10^{-5}	⋮
⋮	
10^{-14}	good

HW6 photo w/ num derivatives

accuracy

workable range $|\sigma|$

Resolution $\sigma = .009$

$V_{max} \sim 0.18 \quad (20\,\sigma)$

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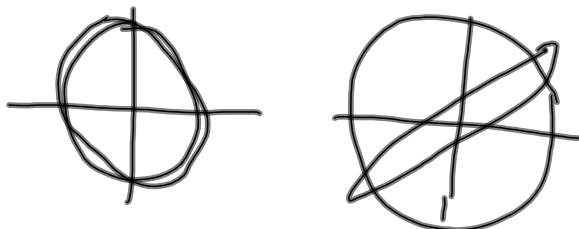
43-4

Exam 2
seq. formation of NE
minimal constraints

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$$Q_{vv} W = \overline{W} \qquad \text{43-5}$$

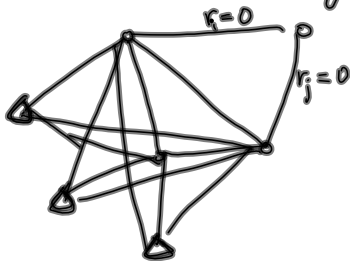$$w_{\bar{\imath}\bar{\imath}} = r_i$$

$$\overset{n}{\underset{i=1}{\sum}} r_i = r$$

$$0 \leq r_i \leq 1 \qquad u_i = 1 - r_i$$

$$0 \leq u_i \leq 1$$

r_i : fraction of the error in obs. i which is revealed in residual

u_i : fract of error in obs i which is absorbed by the adjustment

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Lesson 43-6

(1) large redundancy

(2) evenly distributed redundancy

if (1) + (2)
  then all B.D. methods work well

if NO ((1) + (2))
  then no B.D. methods work well

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