



TECHNISCHE
UNIVERSITÄT
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VIE_LSM

Scanwise update

Claudia Tierno Ros

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VIE_LSM: state of the art

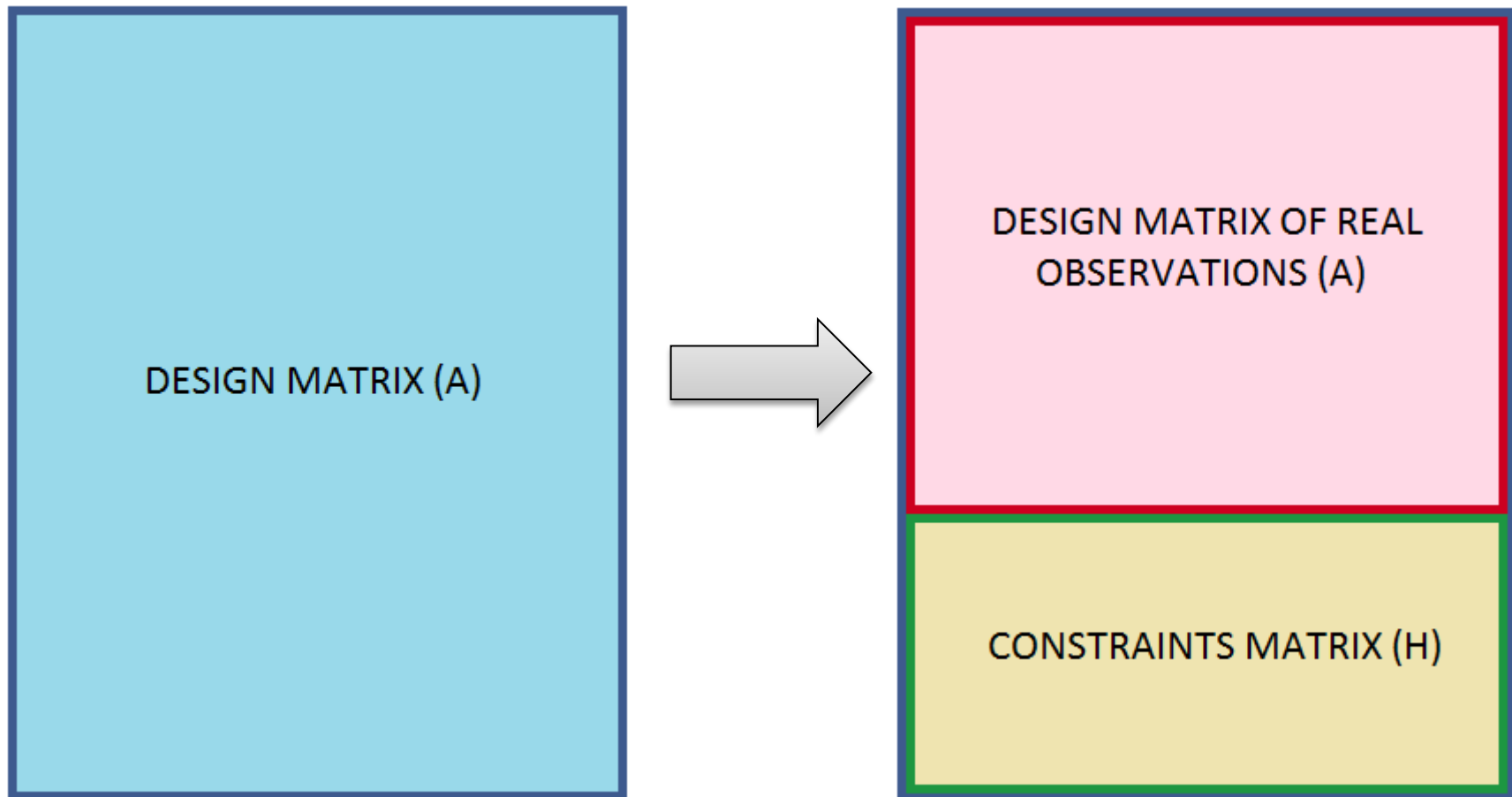
Least squares adjustment

$$N = A^T \cdot P \cdot A$$

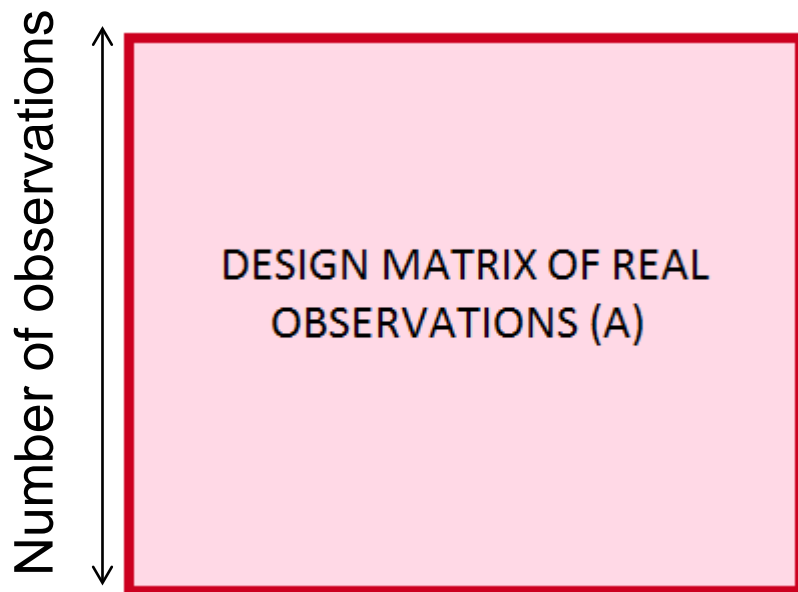
$$b = A^T \cdot P \cdot oc$$

$$x = N^{-1} \cdot b$$

VIE_LSM: state of the art



VIE_LSM: state of the art



VLBI2010 session

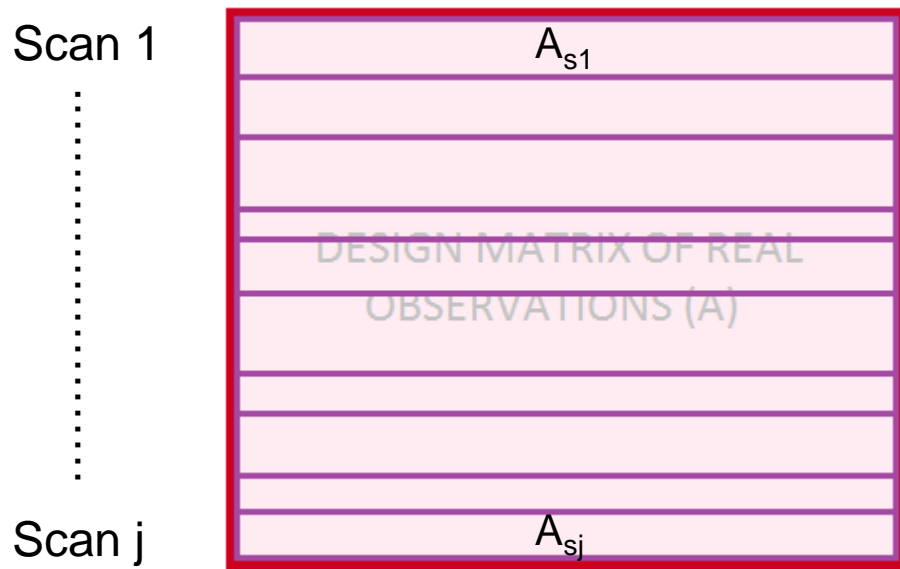
~84000 observations

TOO BIG!!

**SCANWISE
UPDATE**

Scanwise update

1 A-matrix per scan



$$N_{s1} = A_{s1}^T \cdot P_{s1} \cdot A_{s1}$$

$$N_A = N_{s1} + N_{s2} + \dots + N_{sj}$$

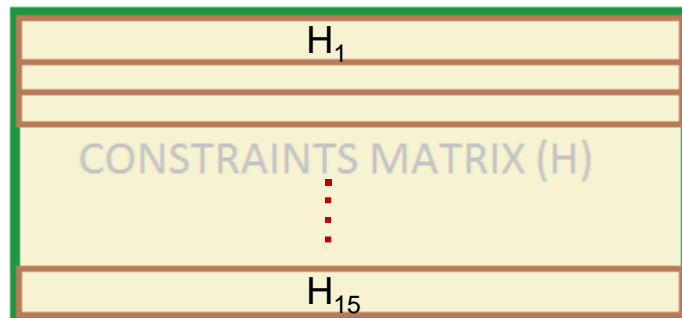
$$b_{s1} = A_{s1}^T \cdot P_{s1} \cdot oc_{s1}$$

$$b_A = b_{s1} + b_{s2} + \dots + b_{sj}$$

j : number of scans in the session

Scanwise update

Same procedure with H matrix: 15 H-matrixes



$$N_1 = H_1^T \cdot Ph \cdot H_1$$

$$N_H = N_1 + N_2 + \dots + N_{15}$$

$$b_1 = H_1^T \cdot Ph_1 \cdot oc_1$$

$$b_H = b_1 + b_2 + \dots + b_{15}$$

Scanwise update

Least squares adjustment

$$N = A^T \cdot P \cdot A \quad \rightarrow \quad N = N_A + N_H$$

$$b = A^T \cdot P \cdot oc \quad \rightarrow \quad b = b_A + b_H$$

$$x = N^{-1} \cdot b$$

1st results

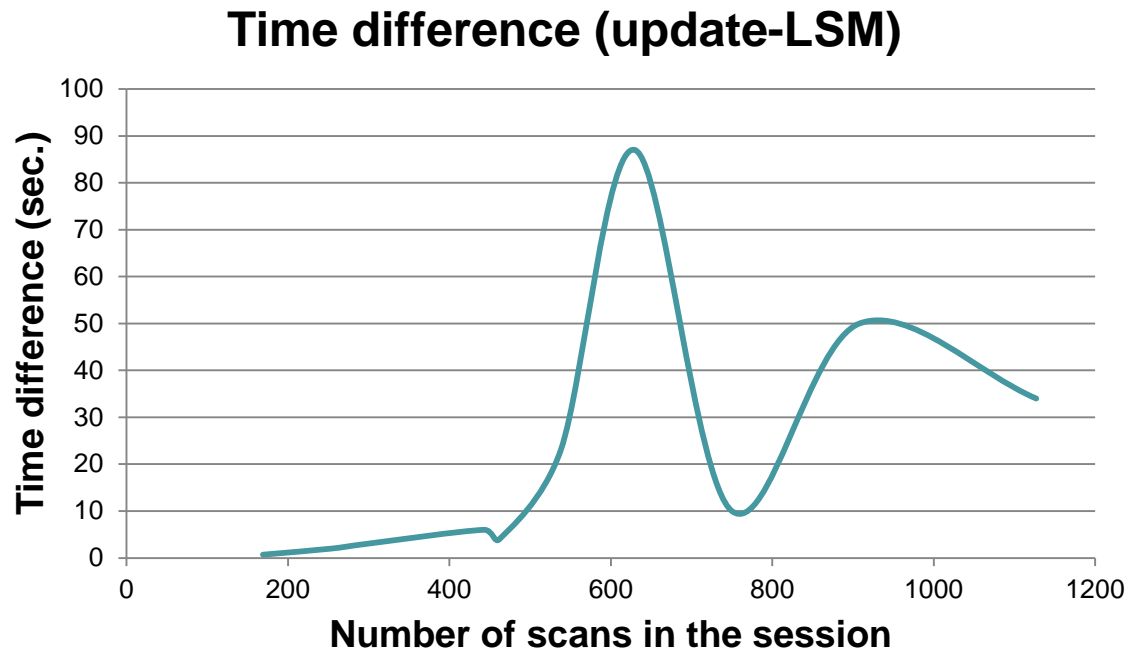
LSM vs Scanwise update → 24 h session

10 sessions have been analysed with
different parametrizations

Differences in x-vector start to appear in
4th decimal place

1st results

LSM vs Scanwise update → 24h session



Default
parametrization

Scanwise update
always slower

1st results

LSM vs Scanwise update → VLBI2010 session

LSM: not possible to analyse

Update: it works, but it takes 7 minutes approx.

Next steps

- 🐎 Try more parametrizations
- 🐎 Calculate residuals $v = Ax - oc_observ$
- 🐎 Make it faster
- 🐎 Outlier test
- 🐎 Global solution
- 🐎 Sinex output
- 🐎 ...

