

Sophistication in UT1-Intensive Scheduling by Using Impact Factors – First Results of Field Tests –

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- Background

Sequential selection of observation $\#(n+1)$

Definition of optimum for next observation

(Sky coverage, covariance matrix, impact factor, ...)

Complying with conditions

(Horizon mask, slewing speeds, SNR limits, ...)

→ Linear optimization process with non-linear conditions

- Theory of impact factors

- Results of Int2 sessions

Design matrix A with singular values in S

$$A = U \cdot S \cdot V^T$$

$$U = \begin{bmatrix} \vdots & & \vdots & \vdots & & \vdots \\ u_1 & \dots & u_r & u_{r+1} & \dots & u_n \\ \vdots & & \vdots & \vdots & & \vdots \end{bmatrix}$$

$\underbrace{\hspace{10em}}_{U_r} \quad \underbrace{\hspace{10em}}_{U_0}$

Left singular vector

$$V = \begin{bmatrix} \vdots & & \vdots & \vdots & & \vdots \\ v_1 & \dots & v_r & v_{r+1} & \dots & v_u \\ \vdots & & \vdots & \vdots & & \vdots \end{bmatrix}$$

$\underbrace{\hspace{10em}}_{V_r} \quad \underbrace{\hspace{10em}}_{V_0}$

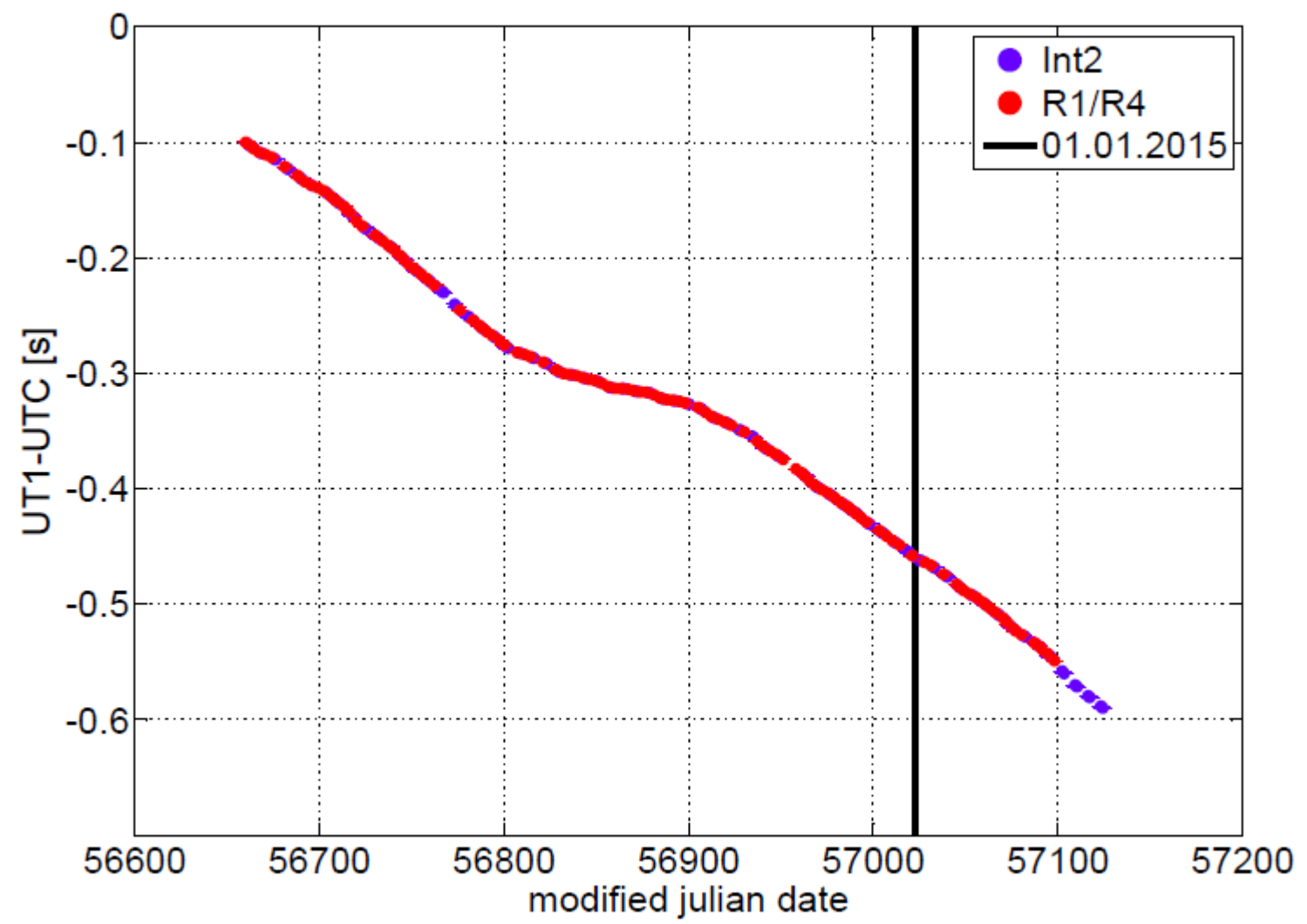
Right singular vector

$$H = U_r U_r^T$$

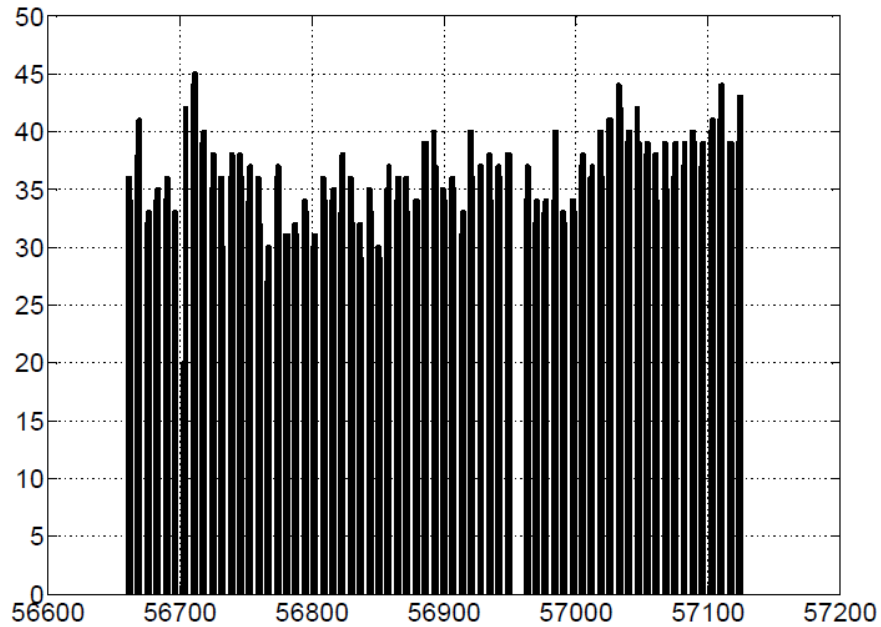
Diagonal elements: Impact factors h ($0 \leq h_i \leq 1$)

- Leverage points
- Important for geometrical stability
- Significant impact on accuracy of estimated parameters

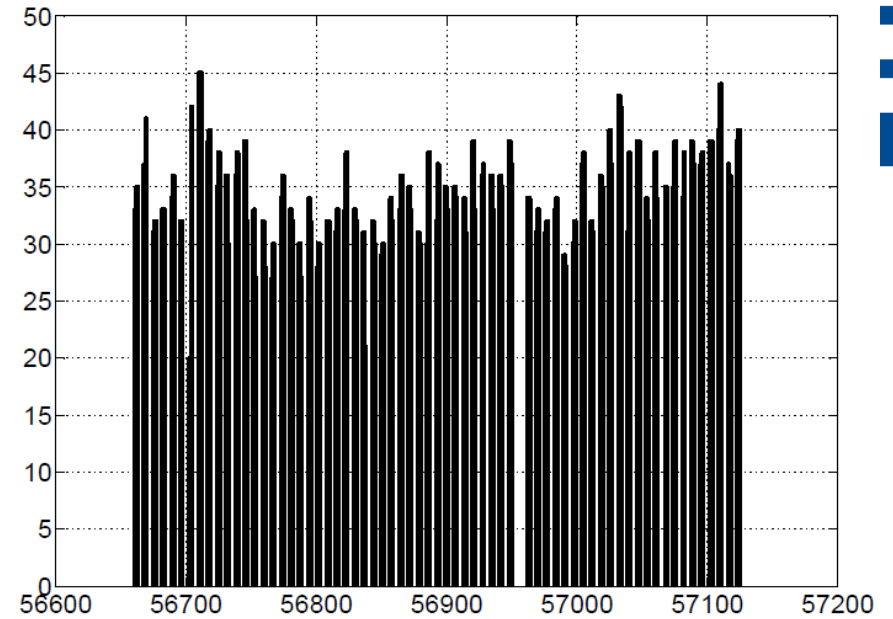
- Int2 sessions with ~40 single baseline observations in 1 hr
- 6 initial observations for $\Delta UT1$, cl_0 , cl_1 , cl_2 , at_a , at_b
- First two Int2 test sessions in August 2014
- All Int2 sessions since January 1, 2015
- Results in this study taken from
bkgint14.eopi, gsf2014a.eopi, bkg0014.eoxy, gsf2014a.eoxy

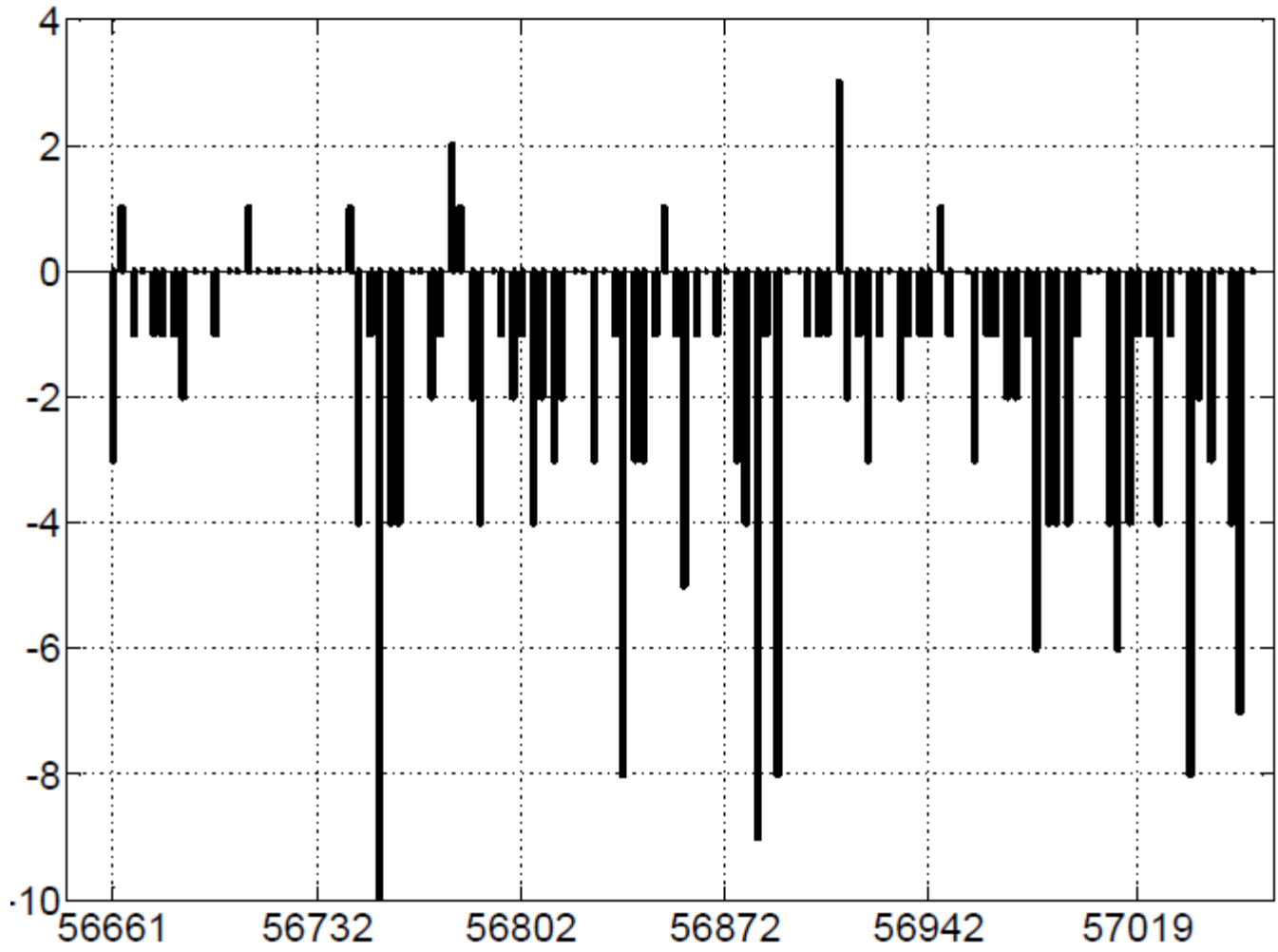


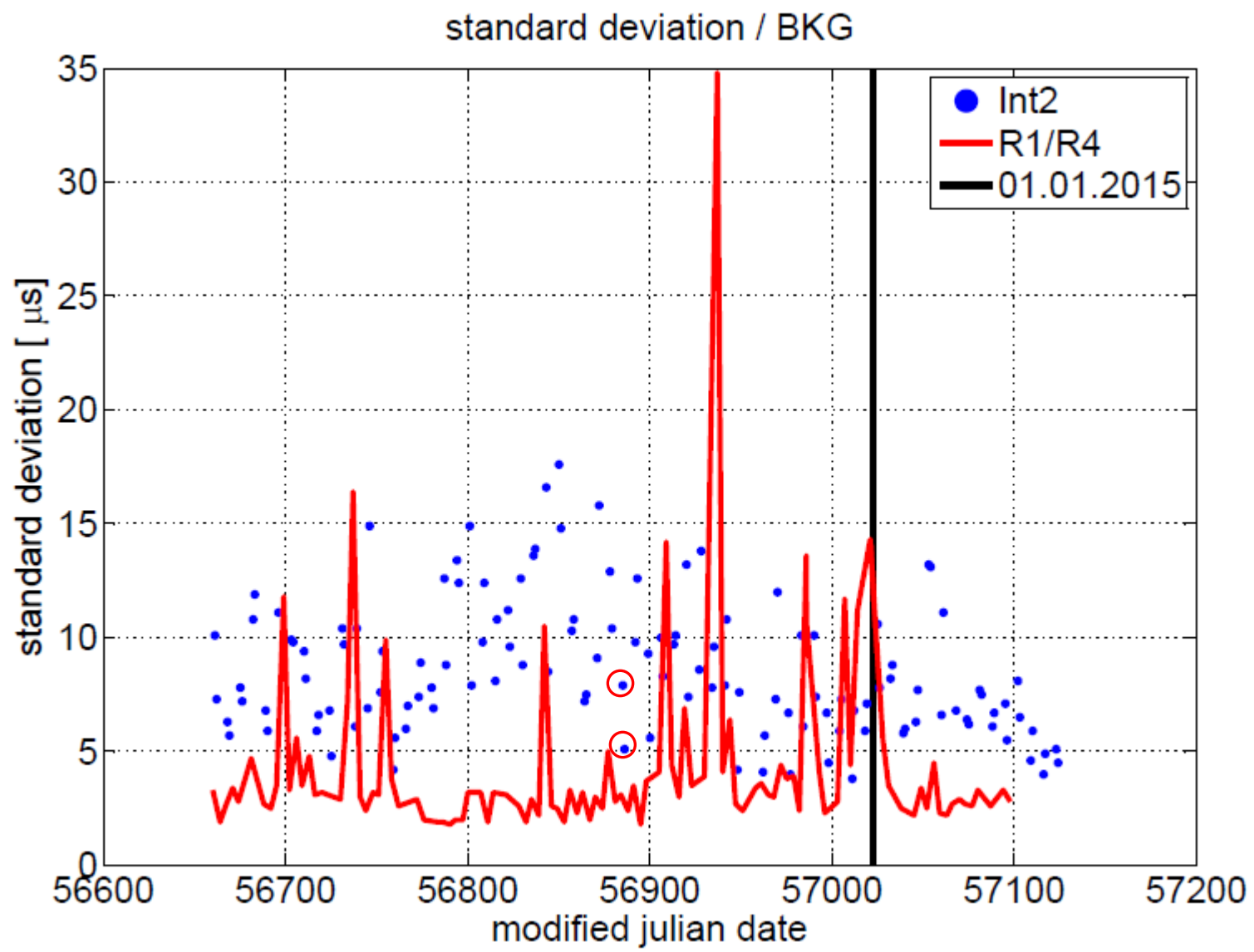
GSFC

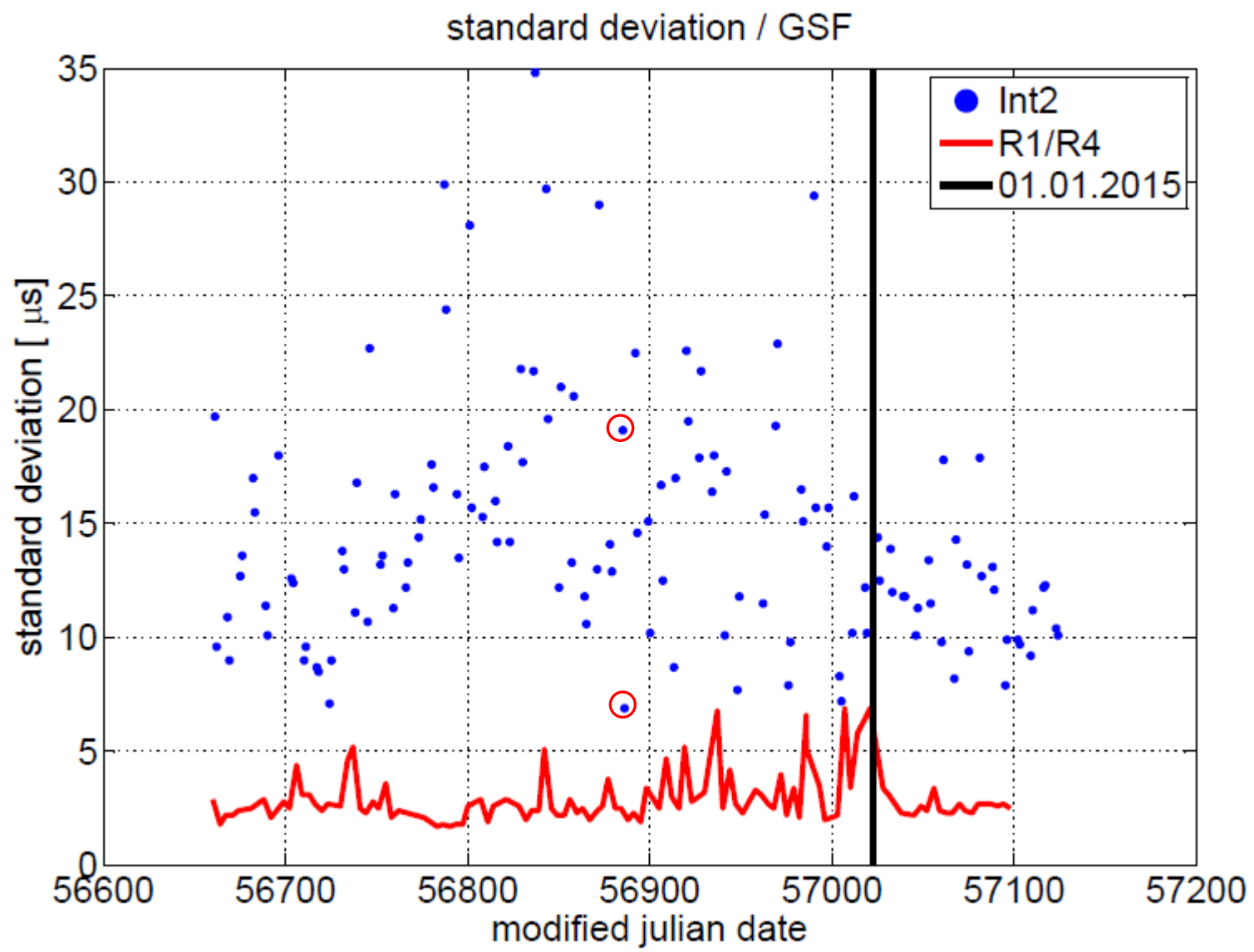


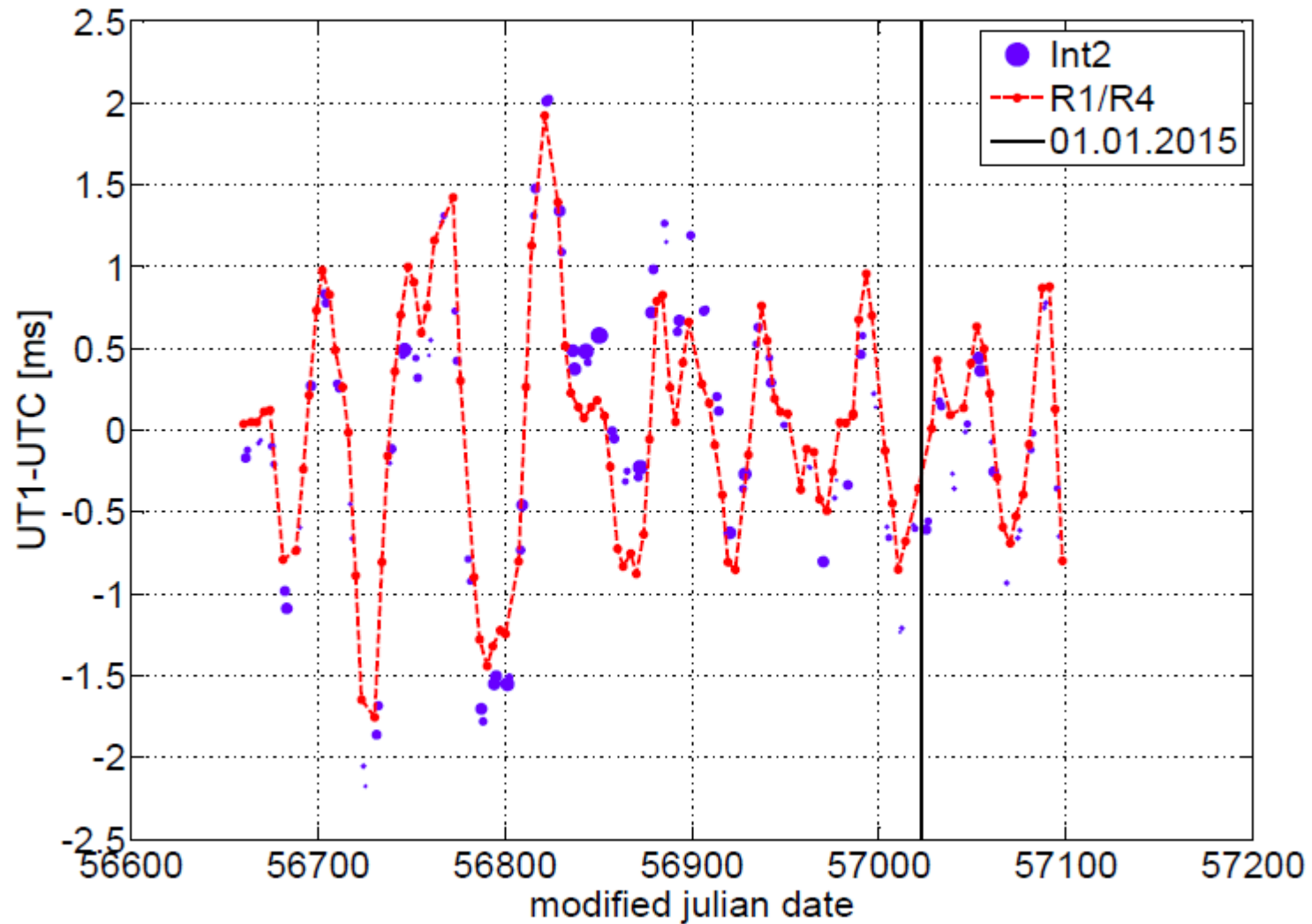
BKG

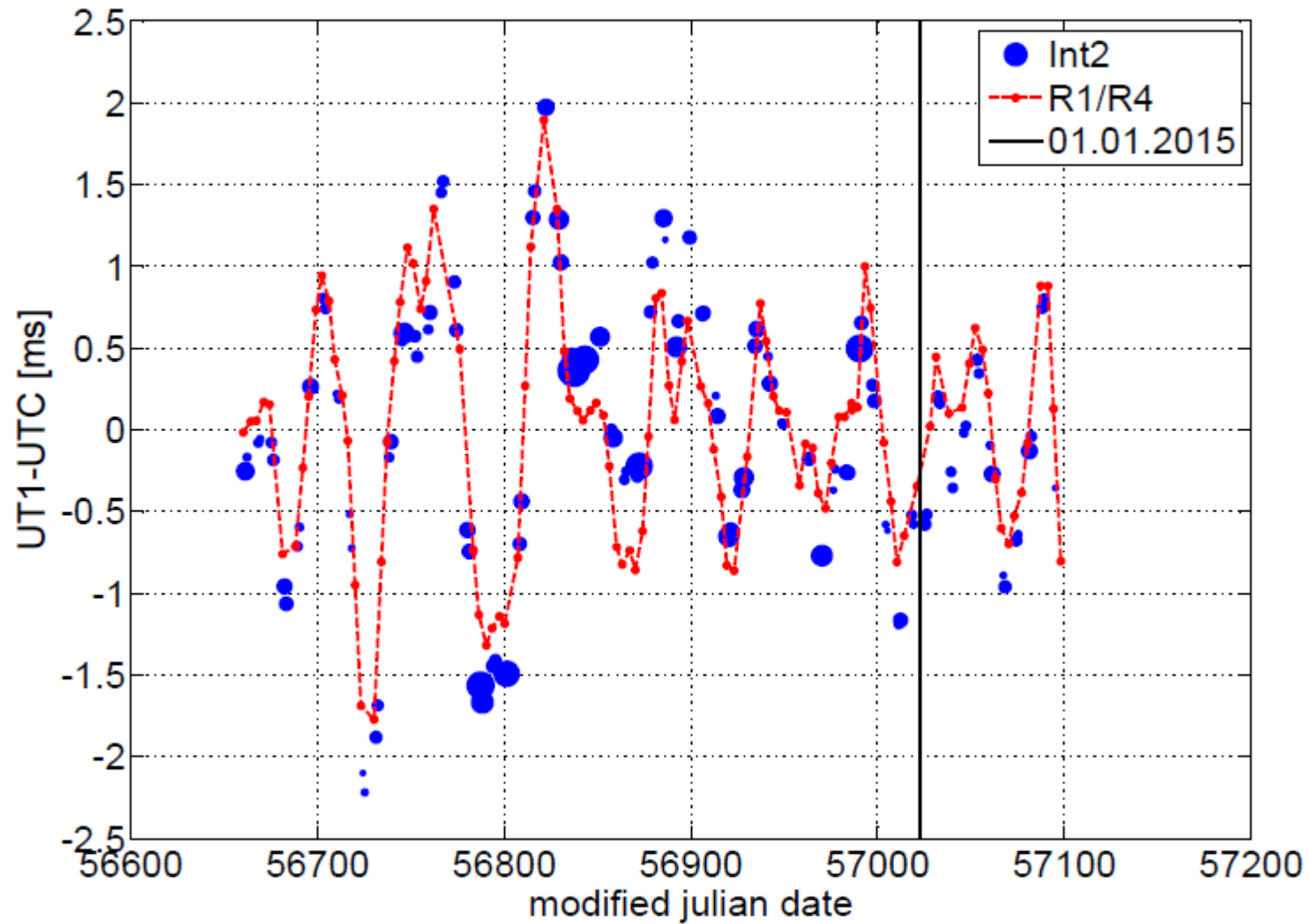












- Scheduling with impact factors
 - Produces smaller formal errors
 - Solutions less prone to outliers
- BKG and GSFC treat outliers differently

