



**About one way to the exception of the systematic
measurements errors in the processing
of the biases SLR data.**

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SLR data analysis
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About the problem

To find the real systematic measurements errors in the SLR data is :

- **Important** for the precise analysis of the measurements and correct interpretation of the data processing results;
- **Difficult** because mistakes of measurements are very small for the SLR data.

But

There is the special mathematical way to the exception of the systematic measurements errors in the processing of the biases data based on the transformation from the standard SLR data to new measurements free of the systematic errors in the pass.

Processing Method for Biased Data

$$\Delta \bar{q} = (\mathbf{W} \mathbf{B}_0^{-1} \mathbf{W}^T)^{-1} \mathbf{W} \mathbf{B}_0^{-1} \Delta \bar{\gamma} = (\mathbf{W} \mathbf{W}^T)^{-1} \mathbf{W} \Delta \bar{\gamma} = \mathbf{F}_0^{-1} \mathbf{V} \quad - \quad \text{LSM}$$

$$\bar{\gamma} = \gamma_1, \dots, \gamma_N \quad - \quad \text{vector of measurements}$$

$$\Delta \gamma_i = \gamma_i^o - \gamma_i^c$$

$$\mathbf{F}_0 = \sum \bar{\omega}_i^T \cdot \bar{\omega}_i; \quad \omega_i = \frac{\partial \gamma_i}{\partial \bar{q}} \cdot \frac{1}{\sigma_i^o}; \quad \sigma_i^o - \text{passport error}$$

$$\mathbf{V} = \sum \bar{\omega}_i^T \cdot \Delta \gamma_i; \quad \Delta \gamma_i = \Delta \gamma_i \cdot \frac{1}{\sigma_i^o}$$

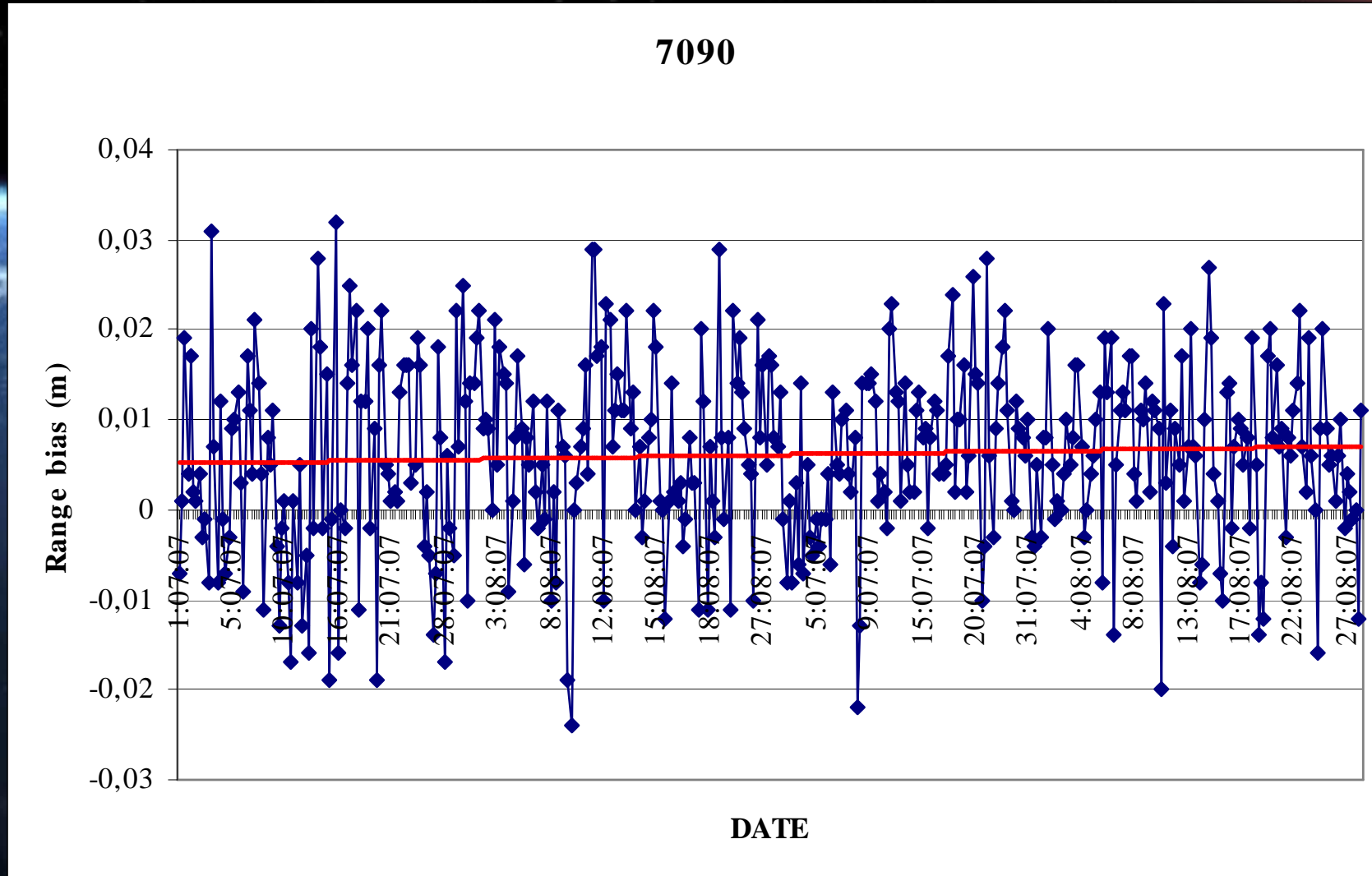
Transformation to New Measurement free of session systematic error $\delta\gamma$

$$\tilde{\gamma}_i = \gamma_i + \delta\gamma - \frac{1}{N} \sum (\gamma_i + \delta\gamma) = \gamma_i + \delta\gamma - \frac{1}{N} \sum \gamma_i - \delta\gamma = \gamma_i - \frac{1}{N} \sum \gamma_i; \quad \tilde{\omega}_i = \omega_i - \frac{1}{N} \sum \omega_i;$$

$$\mathbf{F}_0 = \sum \omega_i^T \omega_i - \frac{1}{N} \sum \omega_i^T \sum \omega_i; \quad \mathbf{V} = \sum \omega_i \Delta \gamma_i - \frac{1}{N} \sum \omega_i \sum \Delta \gamma_i$$

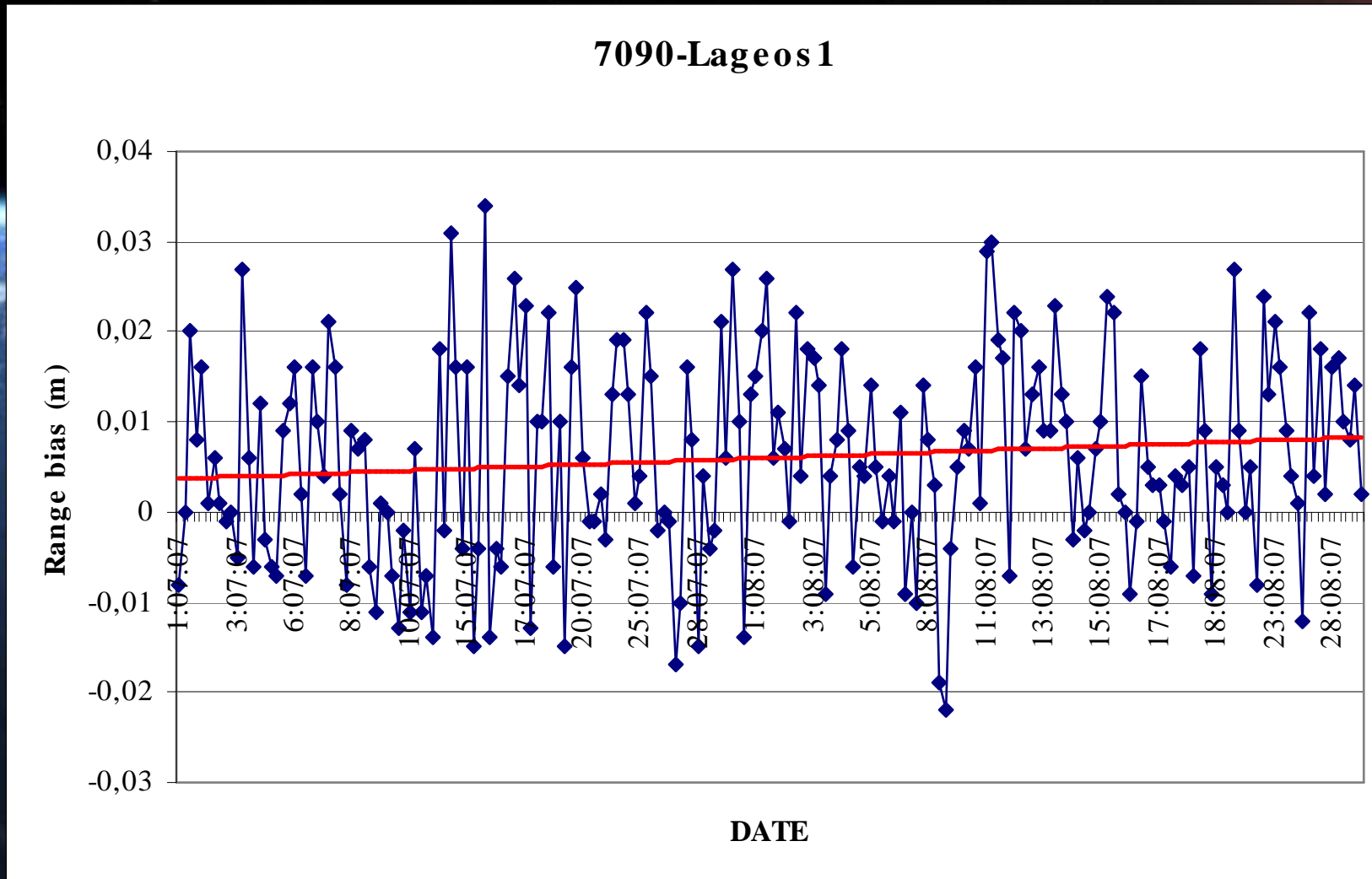
where N - number of measurements

Some processing results

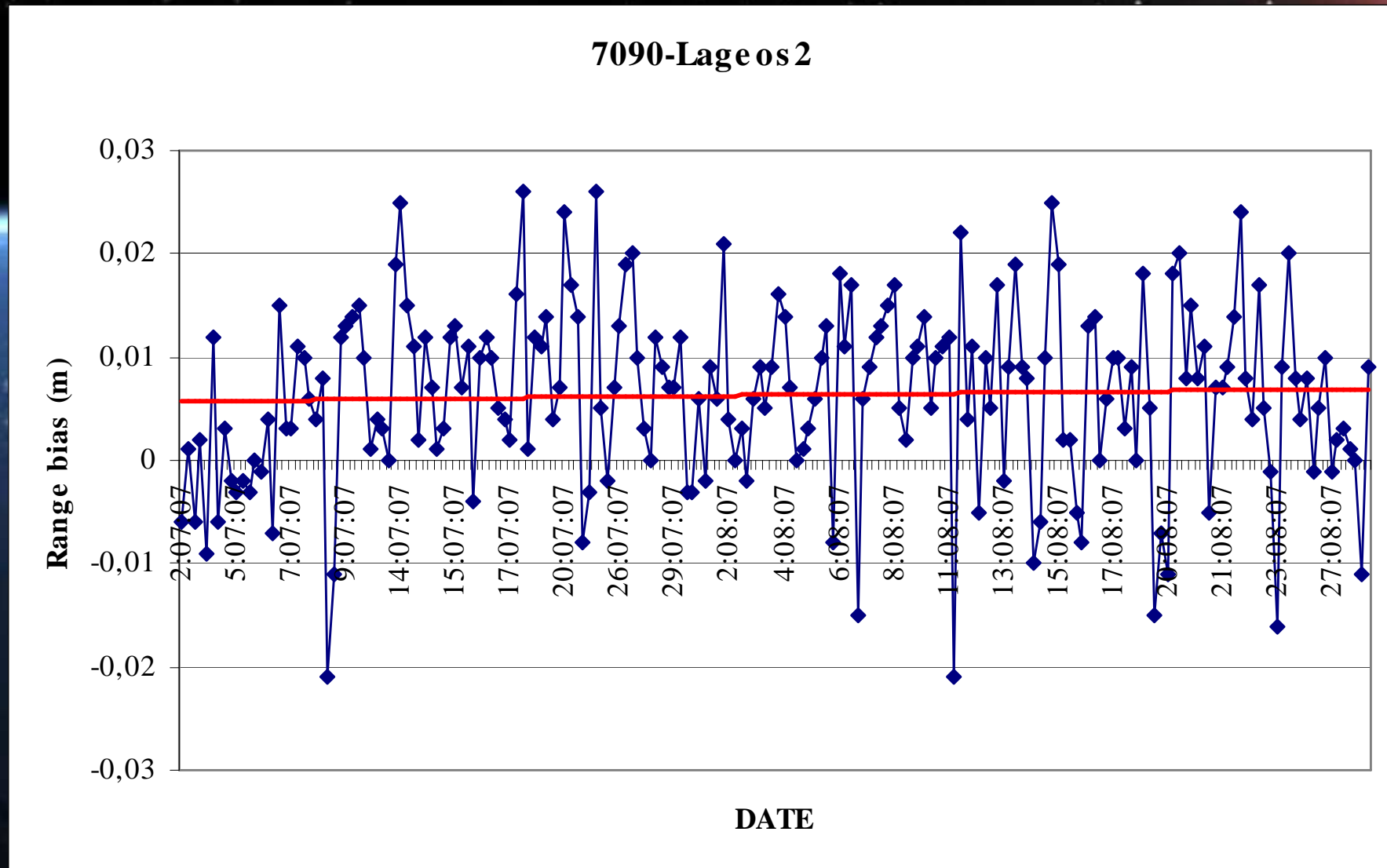


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Some processing results

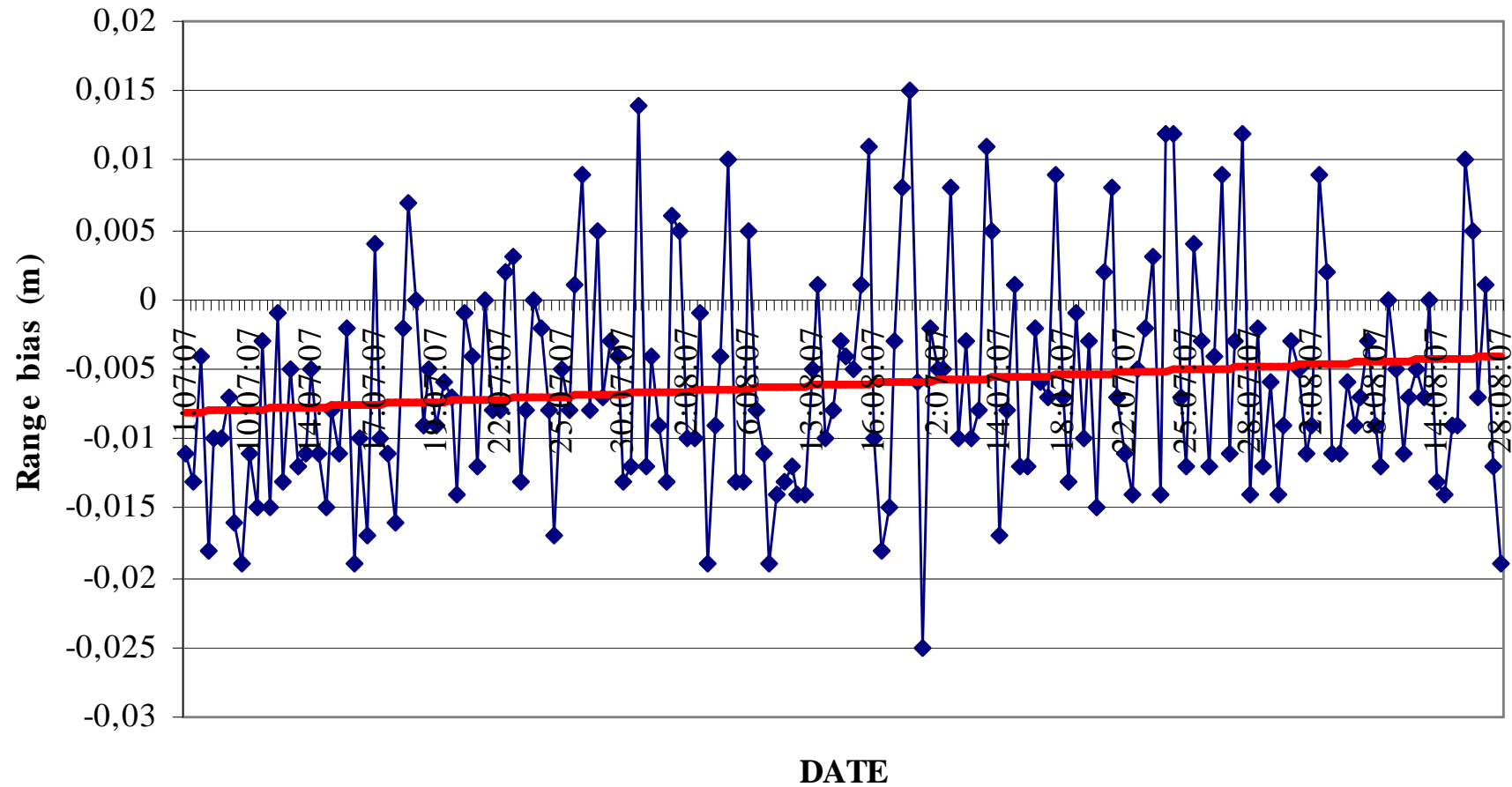


Some processing results



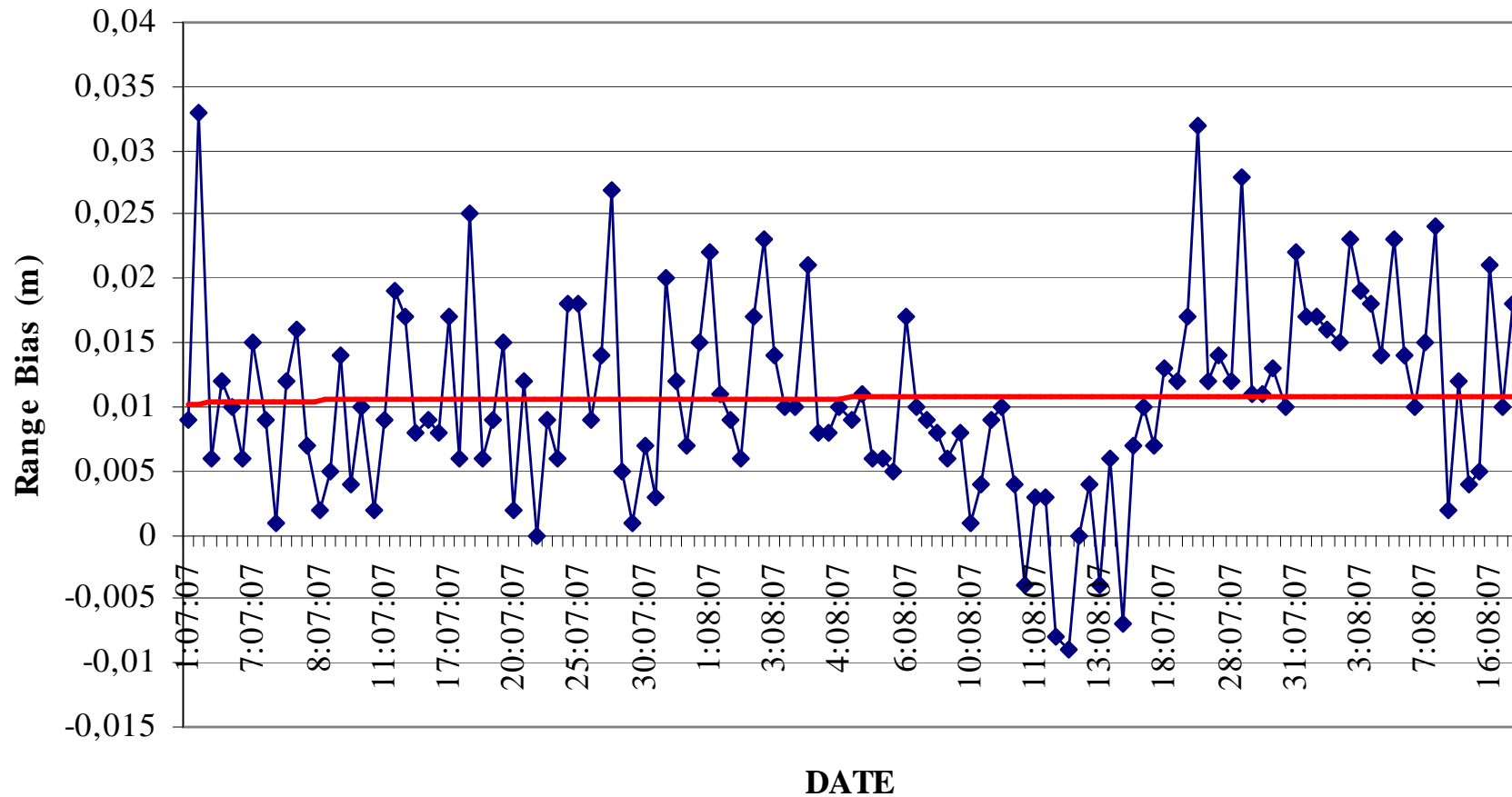
Some processing results

7839



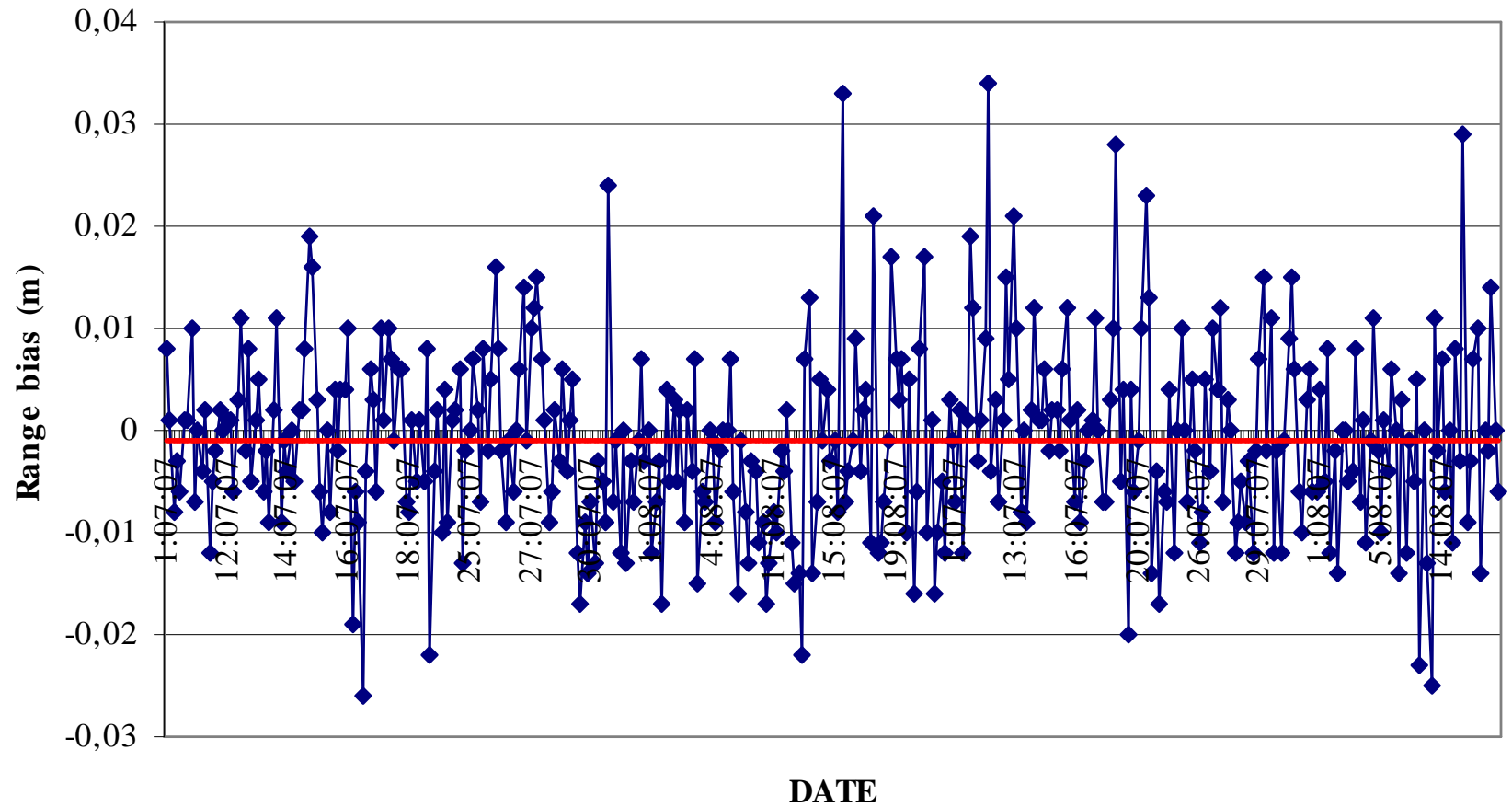
Some processing results

7840

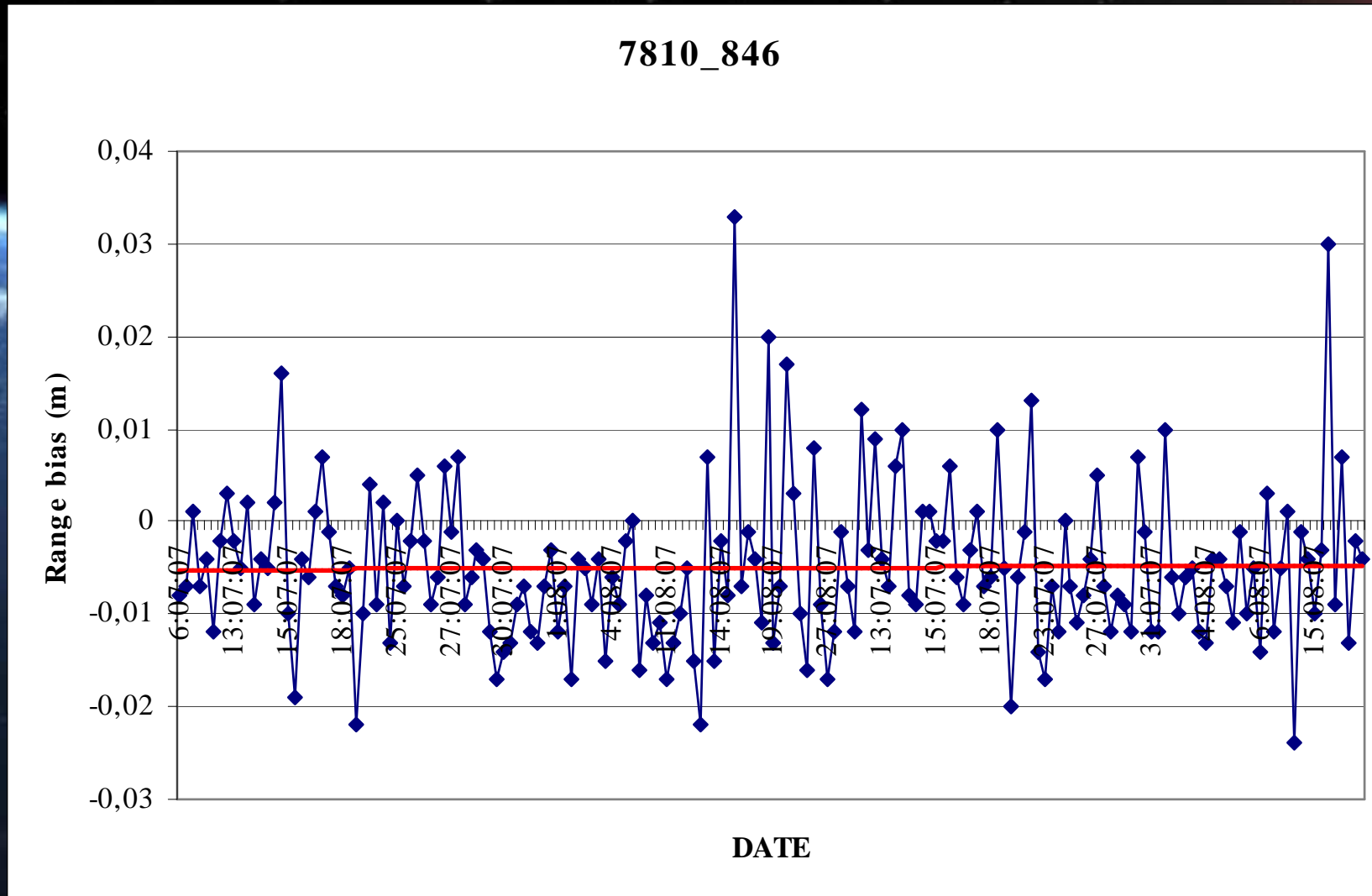


Some processing results

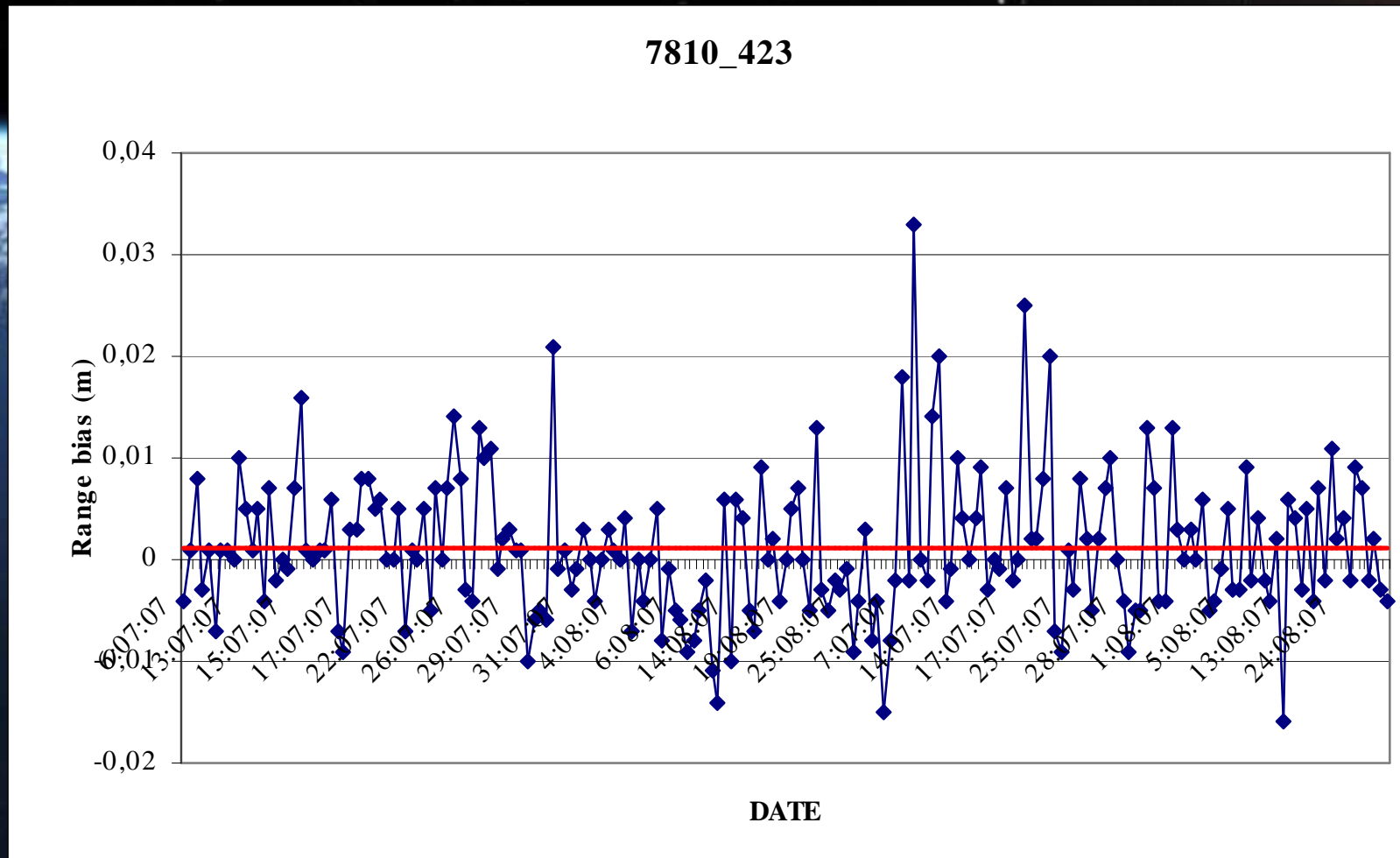
7810 (846+423)



Some processing results

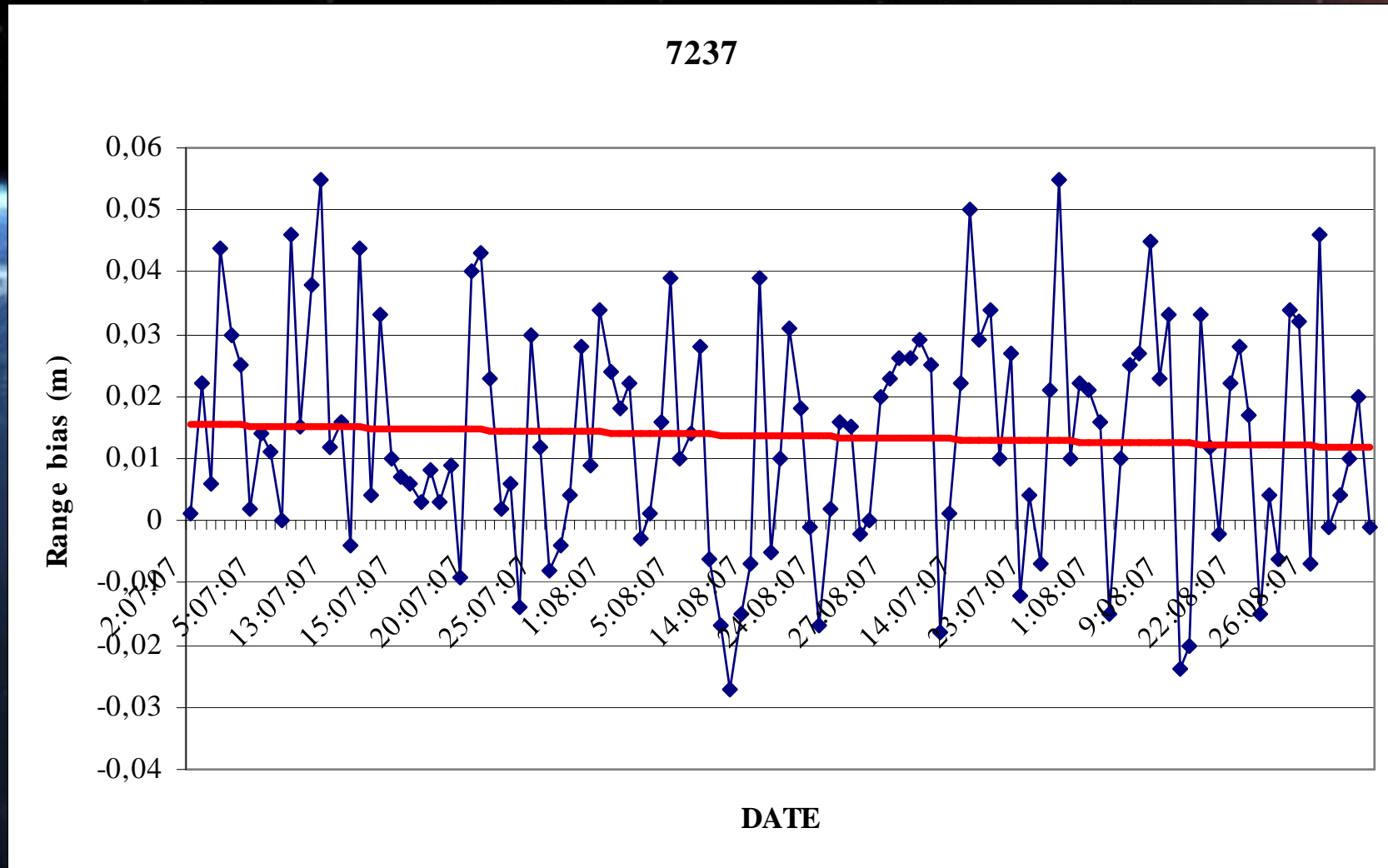


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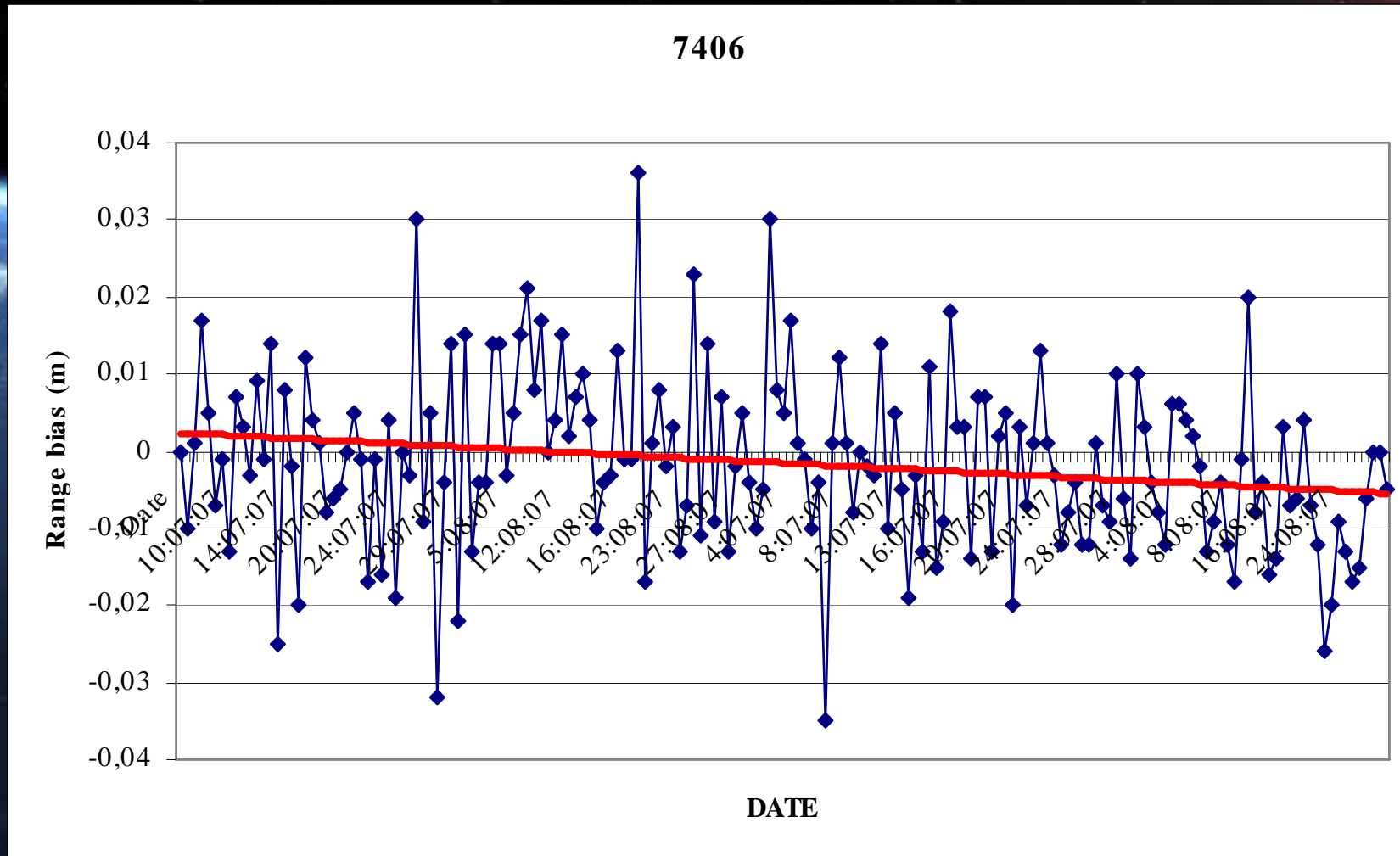


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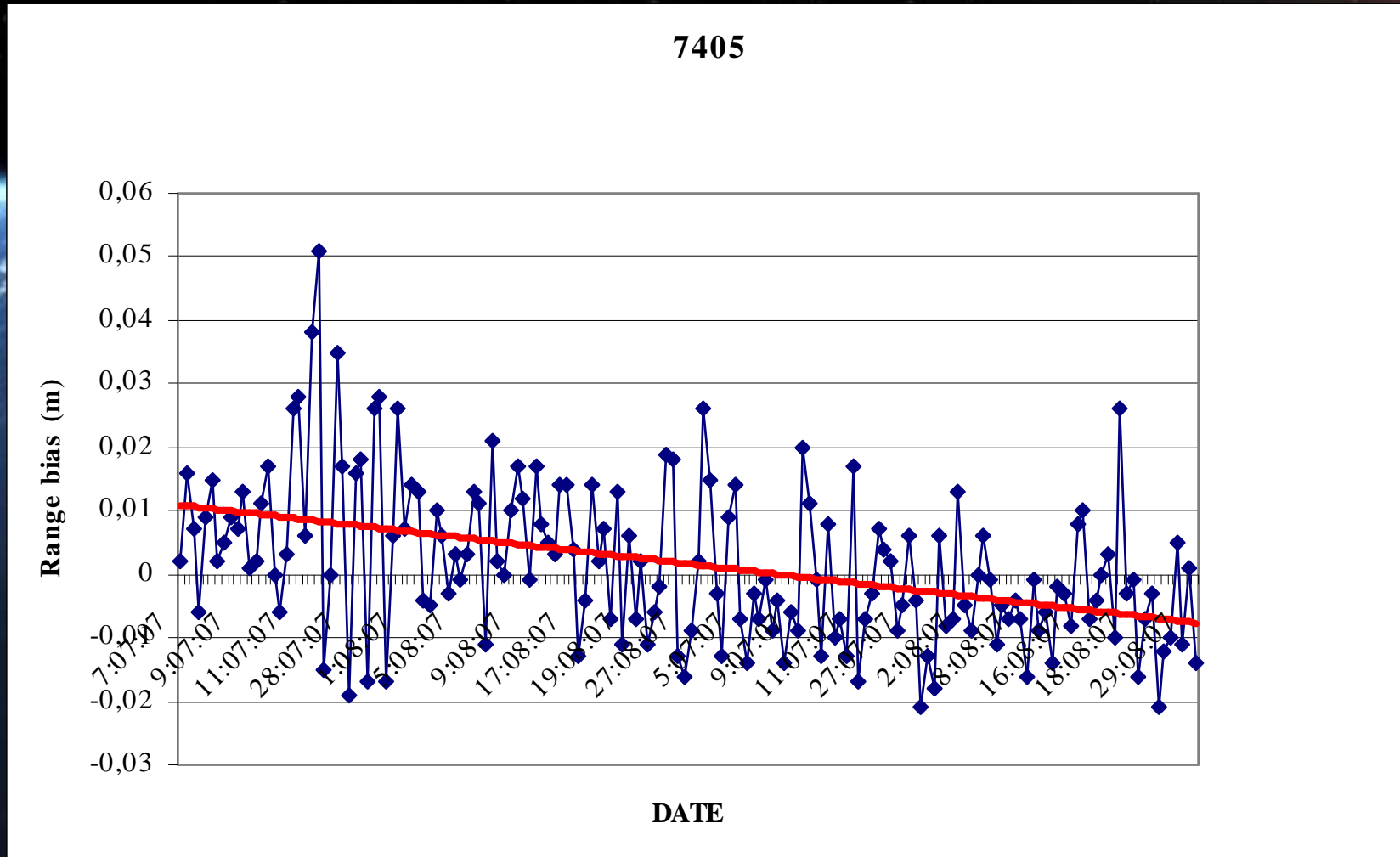
Some processing results



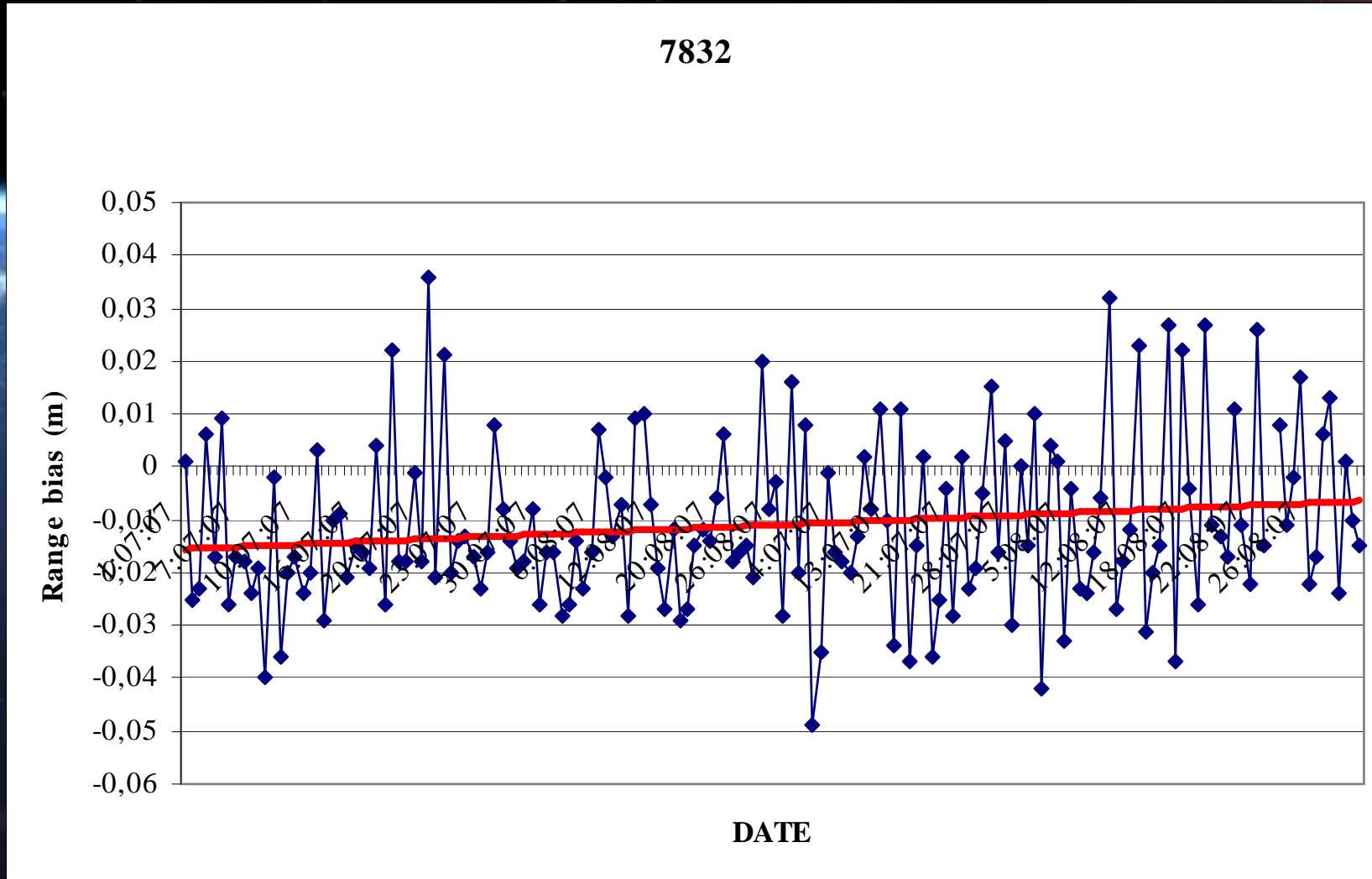
Some processing results



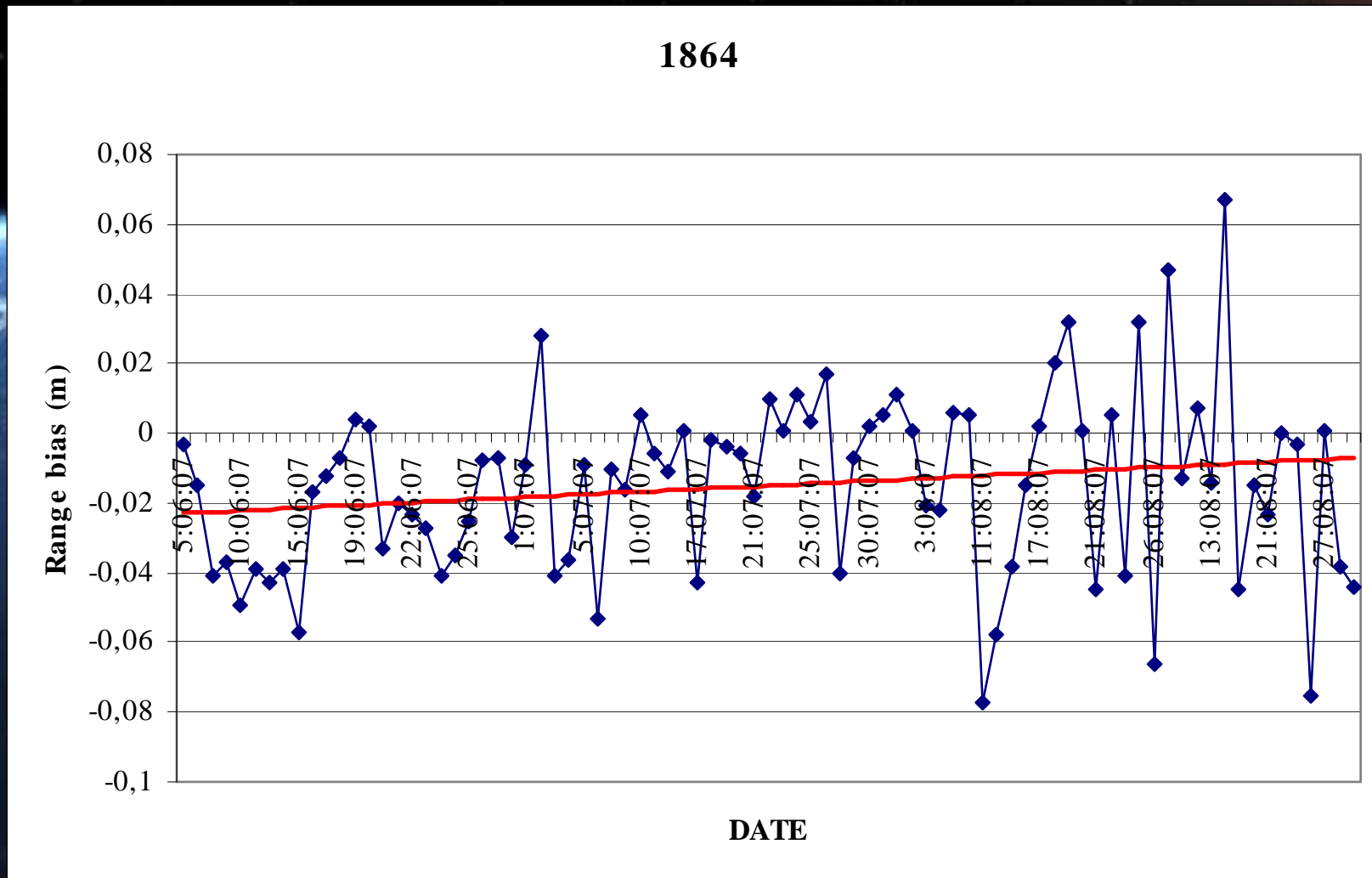
Some processing results



Some processing results

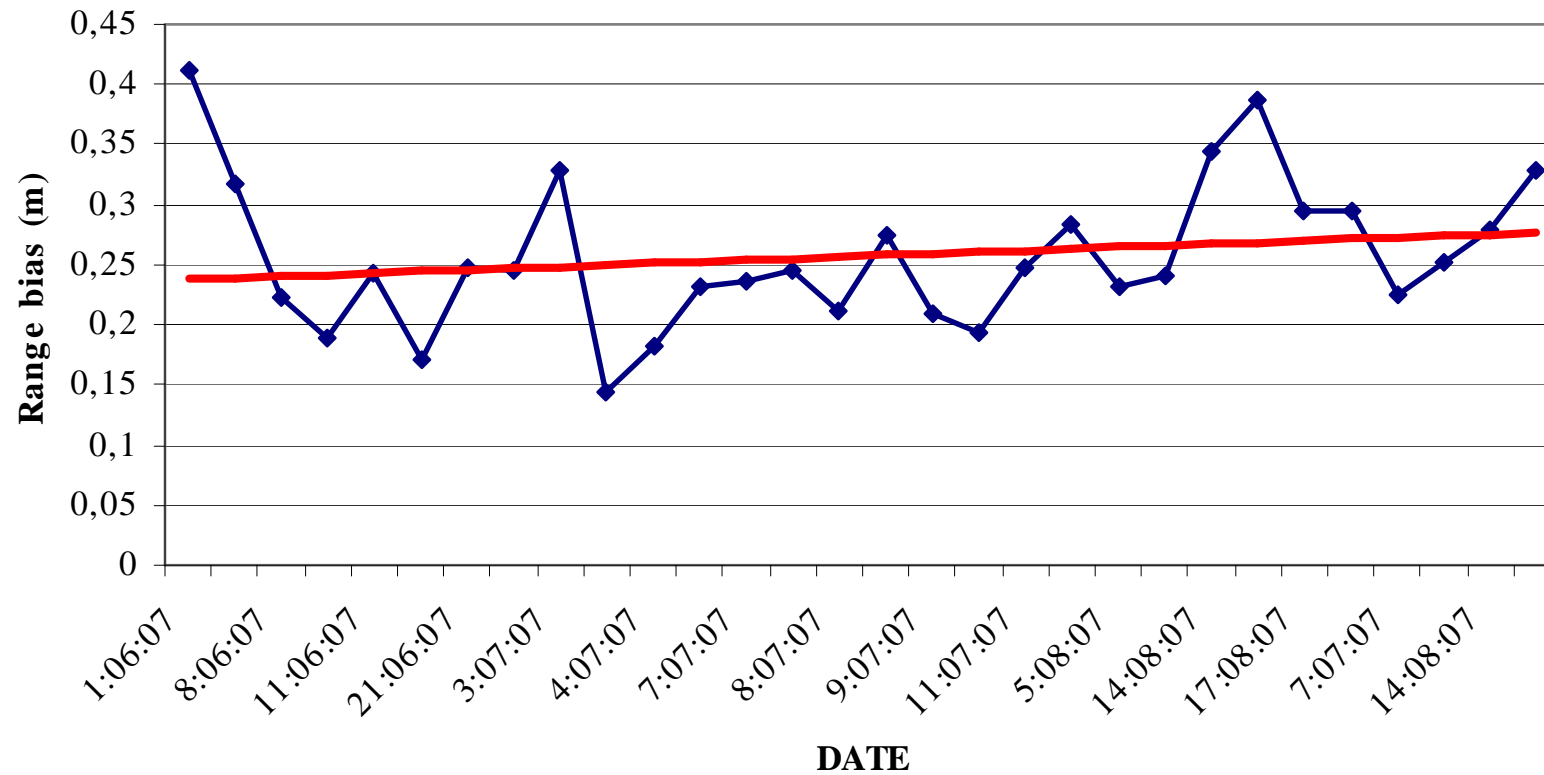


Some processing results



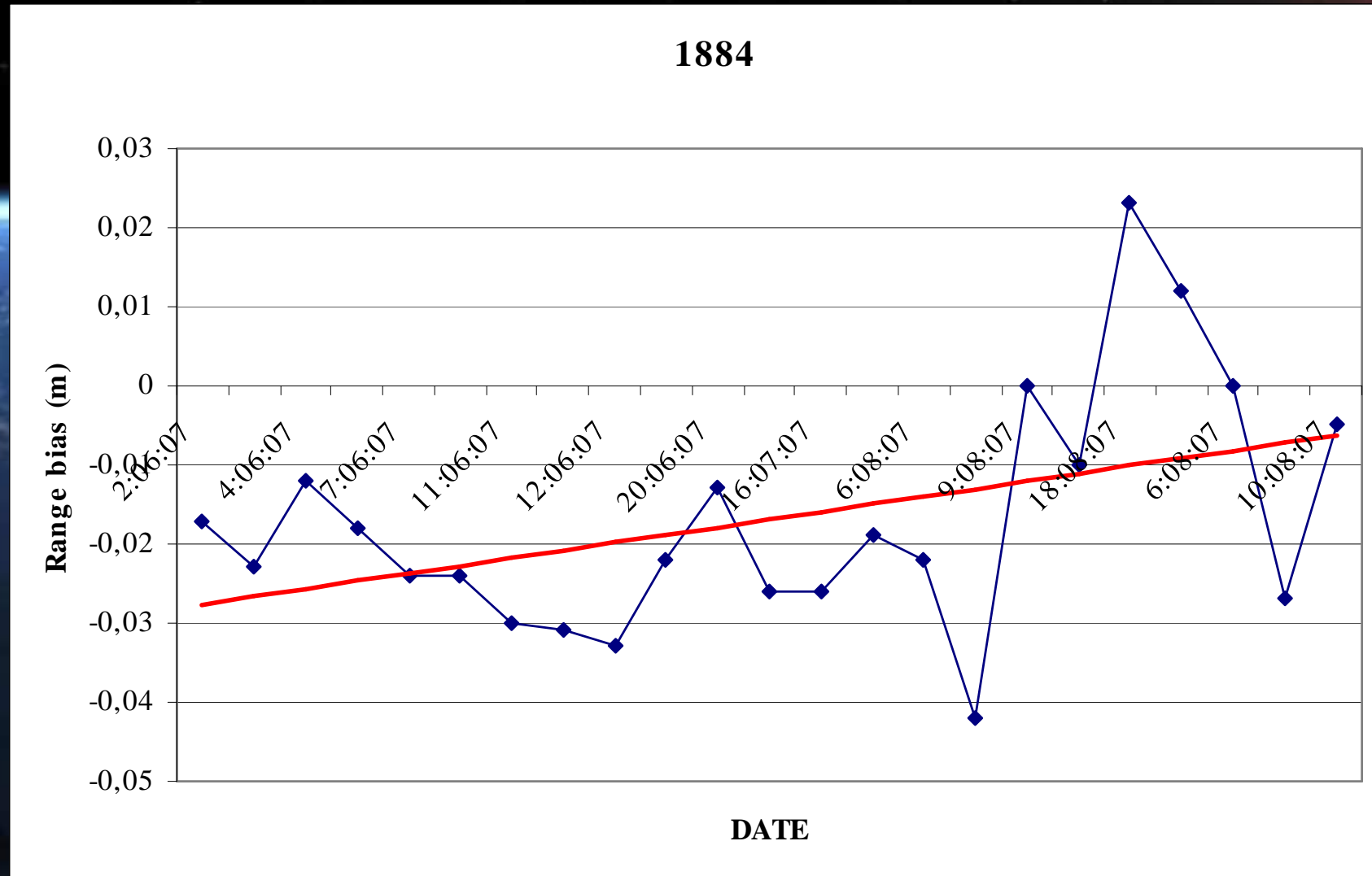
Some processing results

1873



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Some processing results



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Conclusion

- It is necessary to continue the analysis of the final results and reasons of the results
- We are ready to continue this work for any station and different time intervals



Thank you for your attention!

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