



WRMISS - 2018

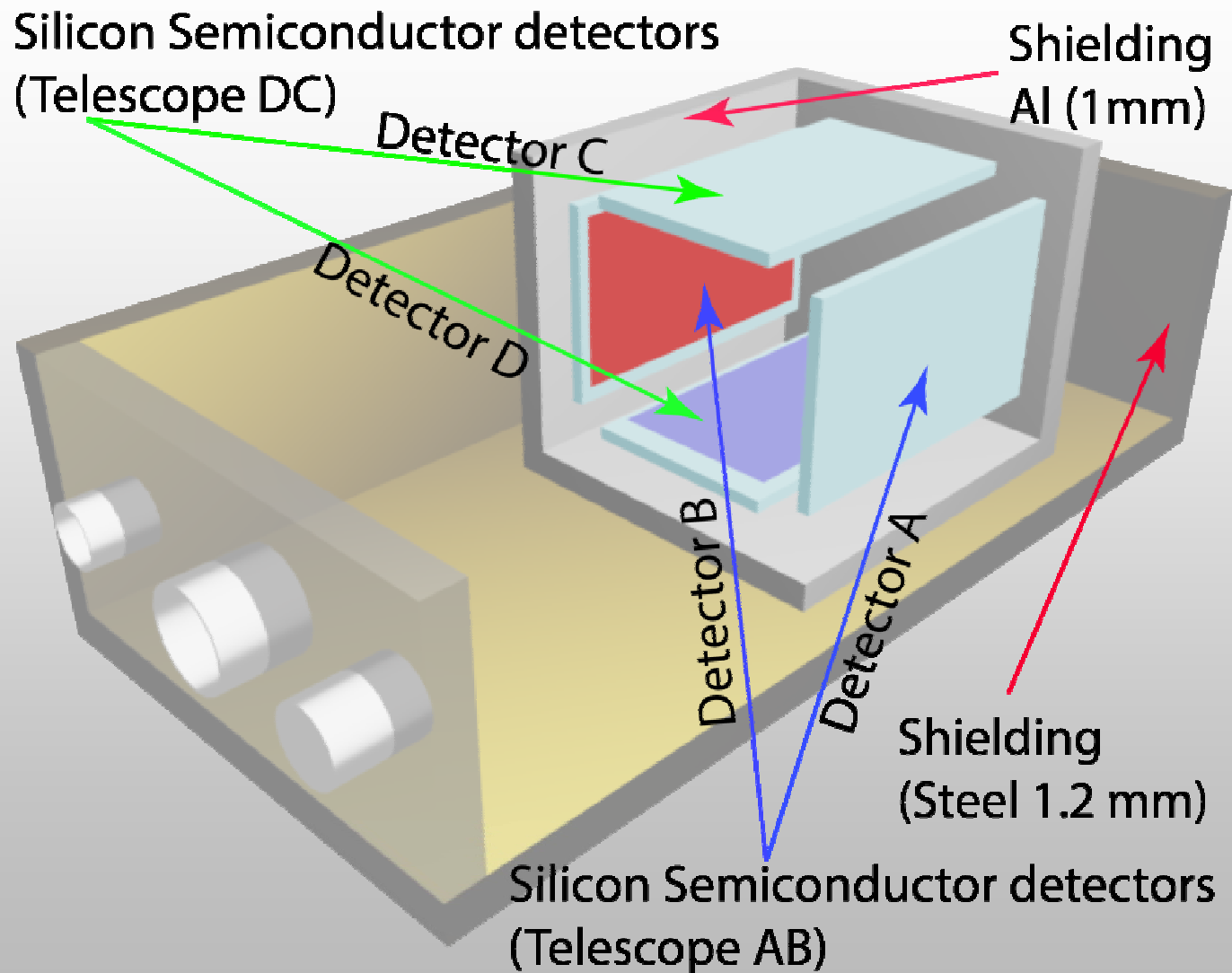
Quantitative estimates of the main dosimetric quantities
based on the LIULIN - MO - ExoMars measurements

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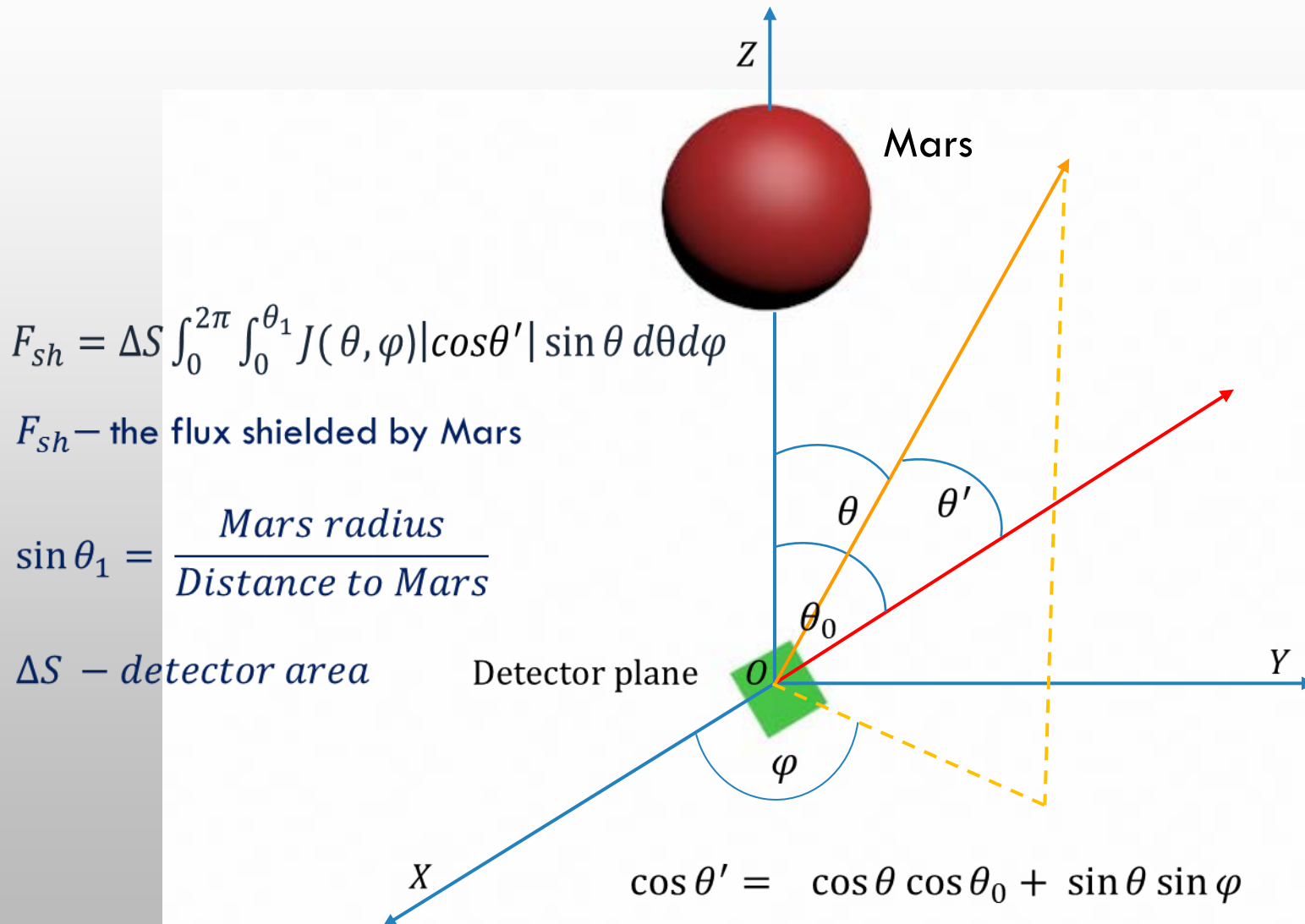
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²IBMP-RAN, Russia

LIULIN – MO description



Mars Shading effect for Flux



Obtained formulas

$$F_{total} = 2\pi J$$

$$R = \frac{F_{sh}}{F_{total}} = \frac{1}{2\pi} \int_0^{2\pi} \int_0^{\theta_1} |\cos\theta'| \sin\theta d\theta d\varphi$$

$$R = \frac{1}{4} (1 - \cos 2\theta_1) \cos \theta_0 \quad \text{when detector plane does not cross Mars}$$

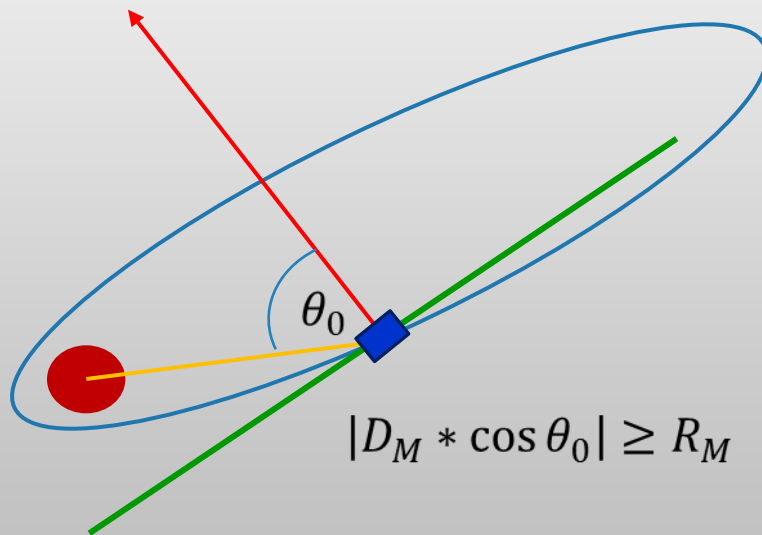
$$R = \frac{1}{4} (1 - \cos 2\theta_1) \quad \text{when } \theta_0 = 0$$

$$R = \frac{(\theta_1 - \sin\theta_1 \cos\theta_1)}{\pi} \quad \text{when } \theta_0 = \frac{\pi}{2}$$

Comparison between two different specific periods

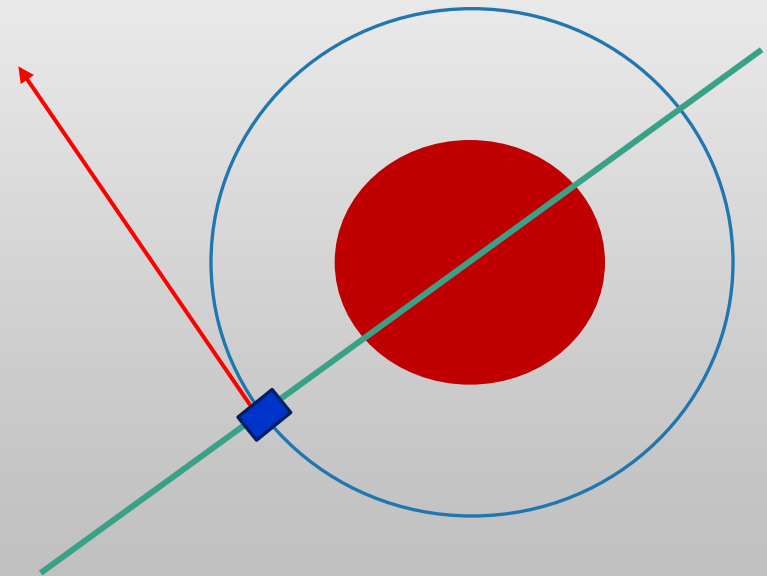
Mars high elliptic orbit

01.11.2016 -17.01.2017

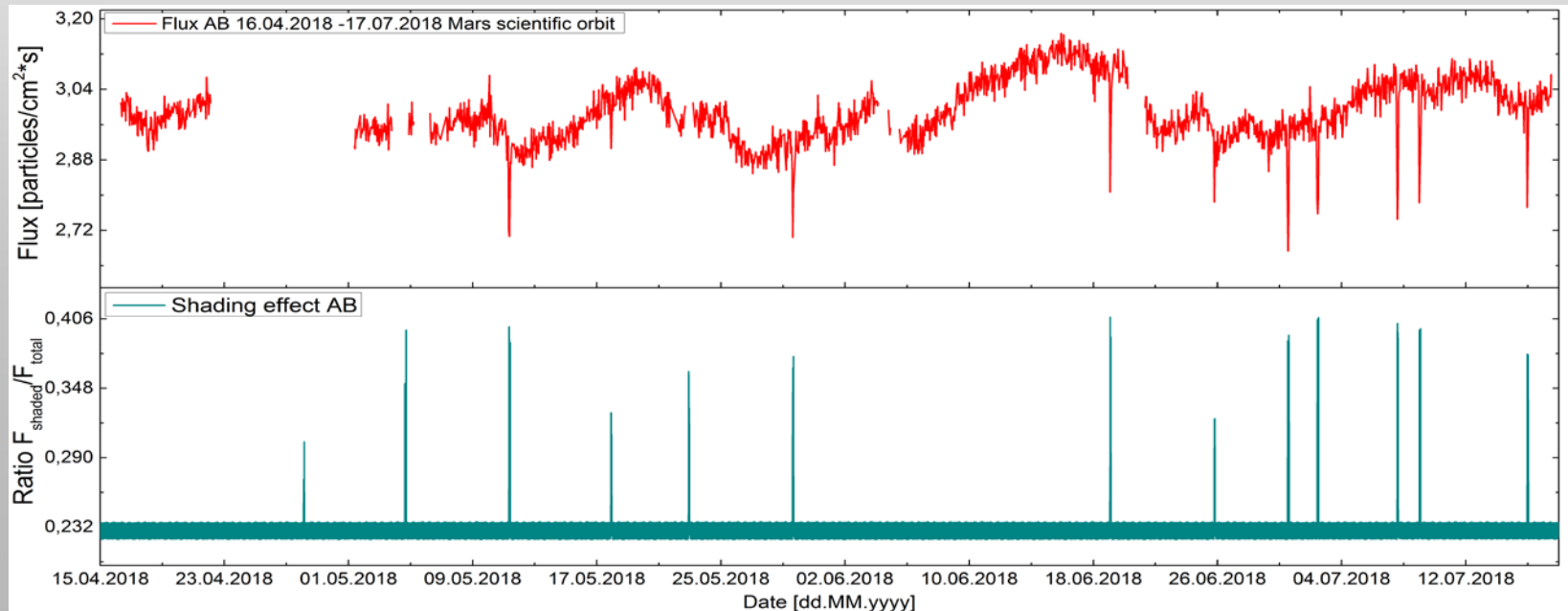
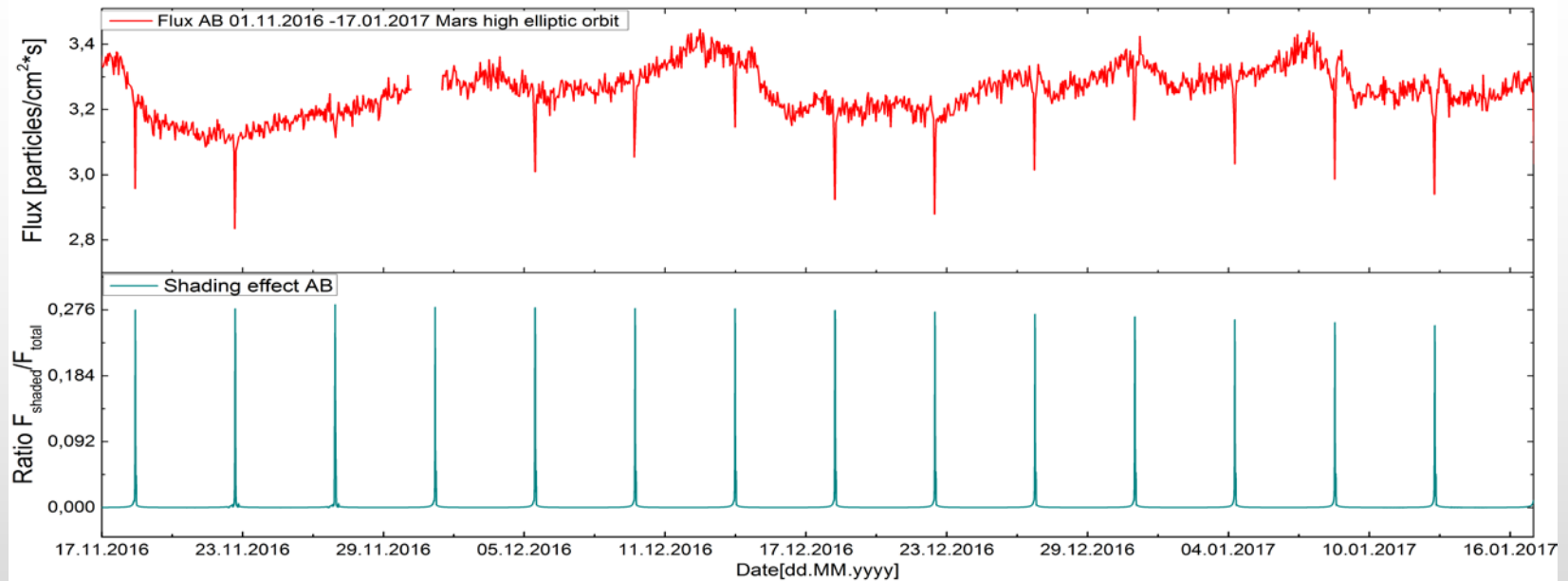


Mars scientific orbit

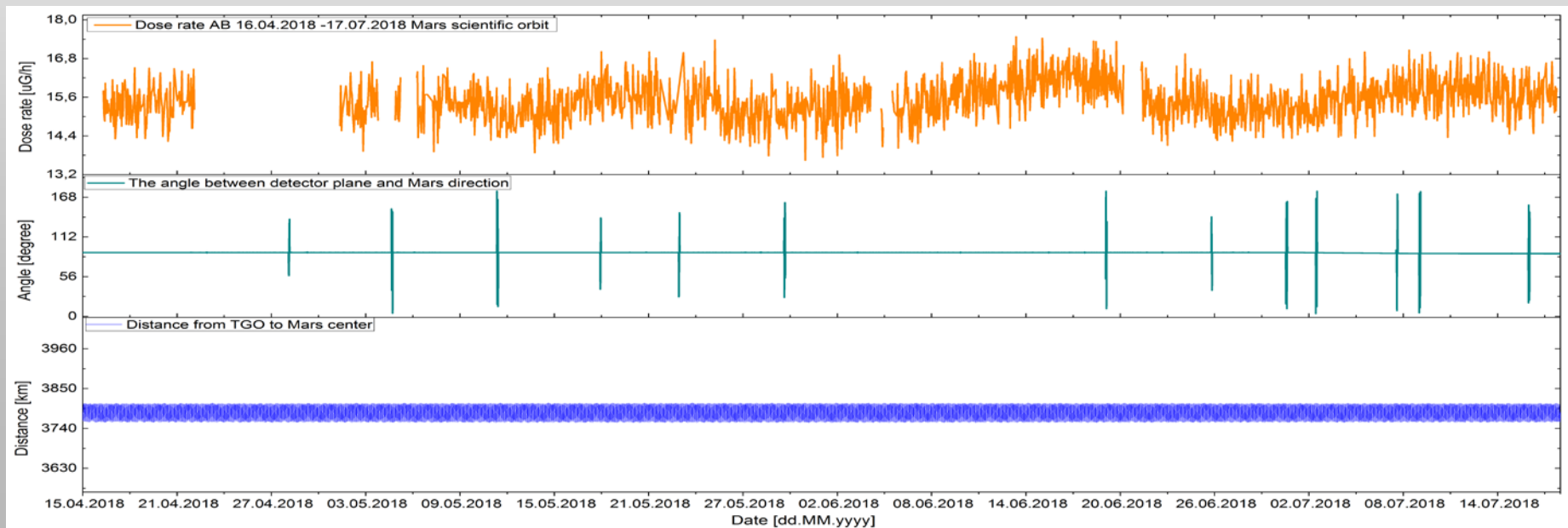
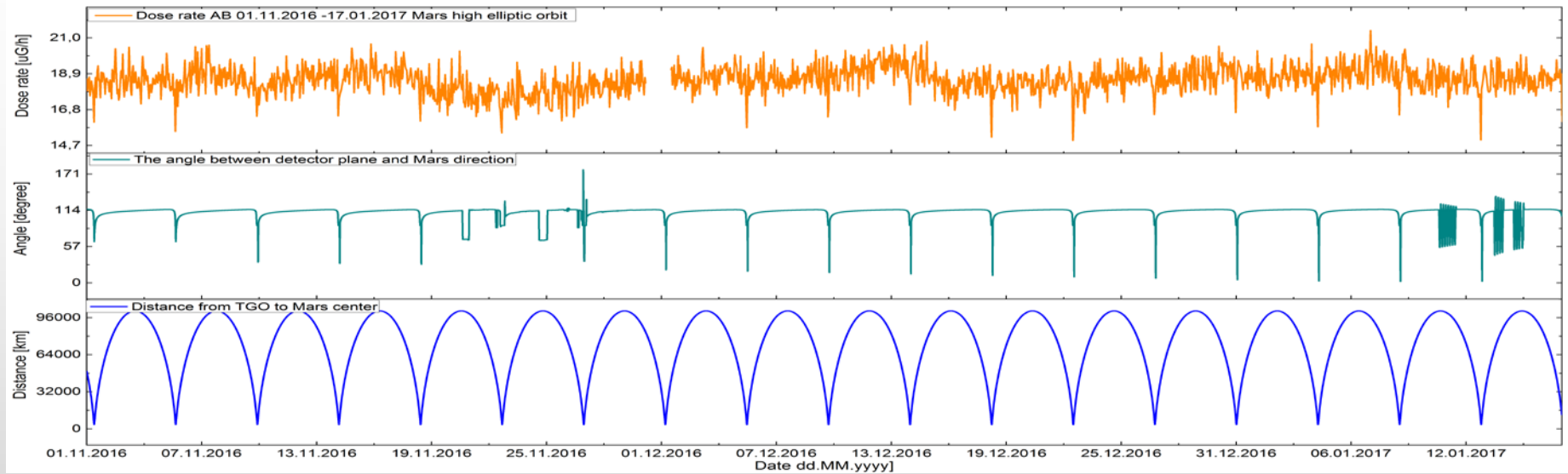
16.04.2018 -17.07.2018

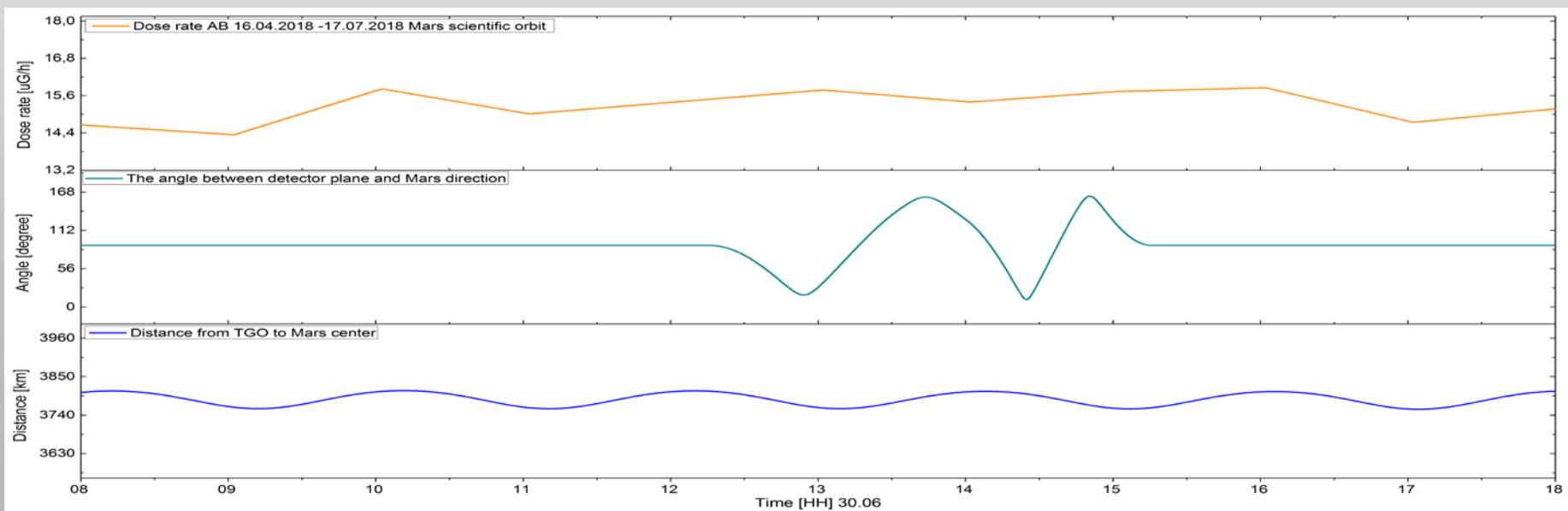
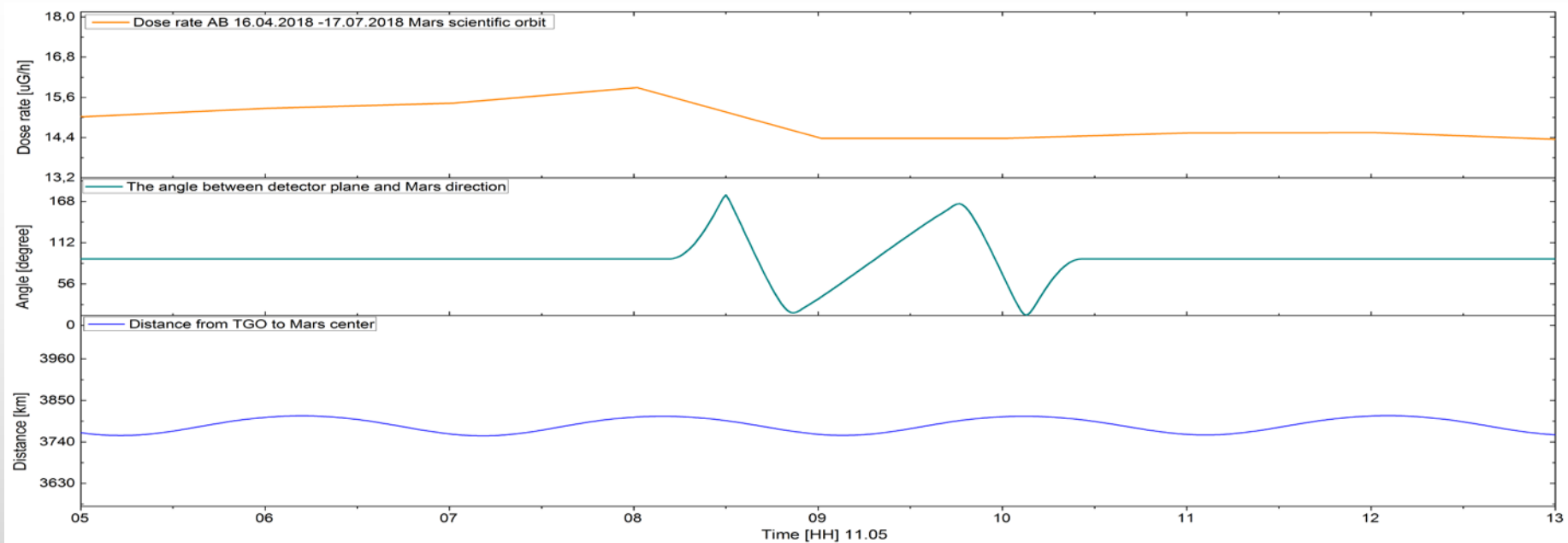


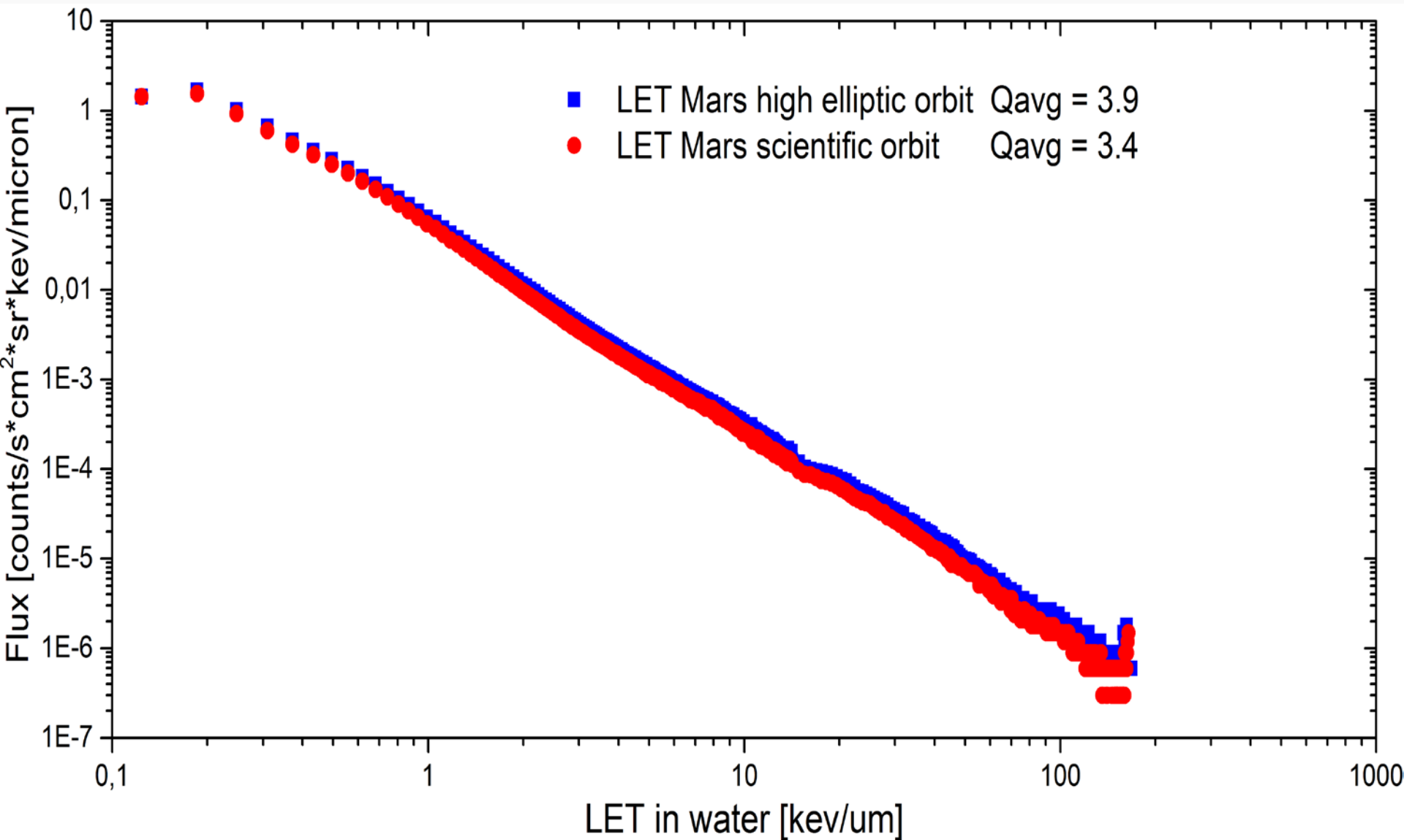
Comparison with experimental data



Measured doses







Conclusions

In low orbit we observe a strong dependence between the flux and the orientation of the instrument (shading 23 – 40 %)

There is no apparent relationship between metered dose and orientation.

Thank you for your attention!