

Latest LIDAL measurements inside Columbus: particle flux and anisotropy

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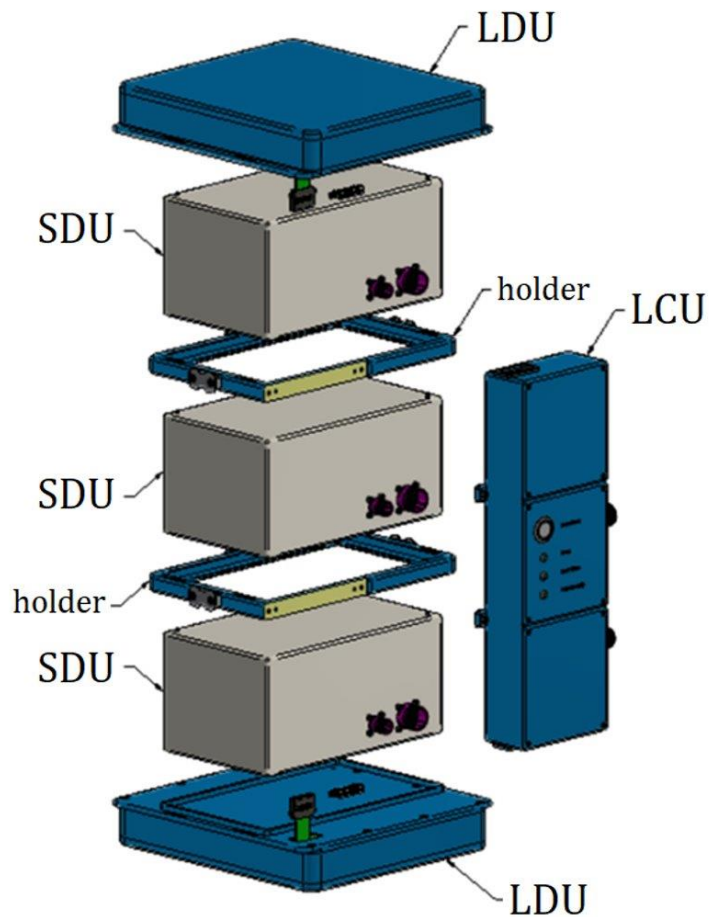
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LIDAL (Light Ion Detector for ALTEA)



3 Silicon
Detector Units
(SDUs) from
ALTEA detector

Each SDU:
6 plane stripped
silicon detector

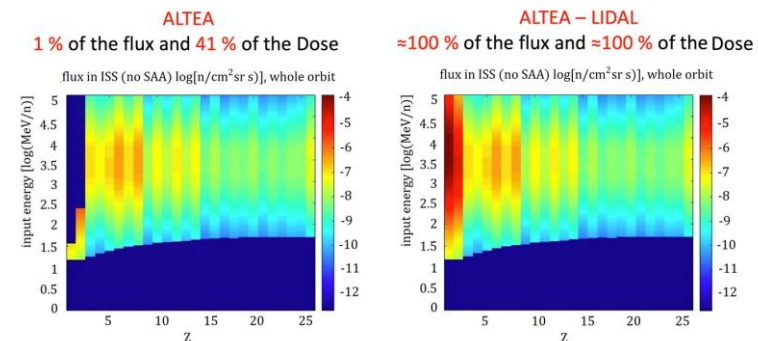
- GF: $230 \text{ cm}^2 \text{ sr}$
- $380 \text{ }\mu\text{m}$ thick
- $8 \times 16 \text{ cm}^2$

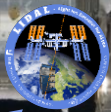
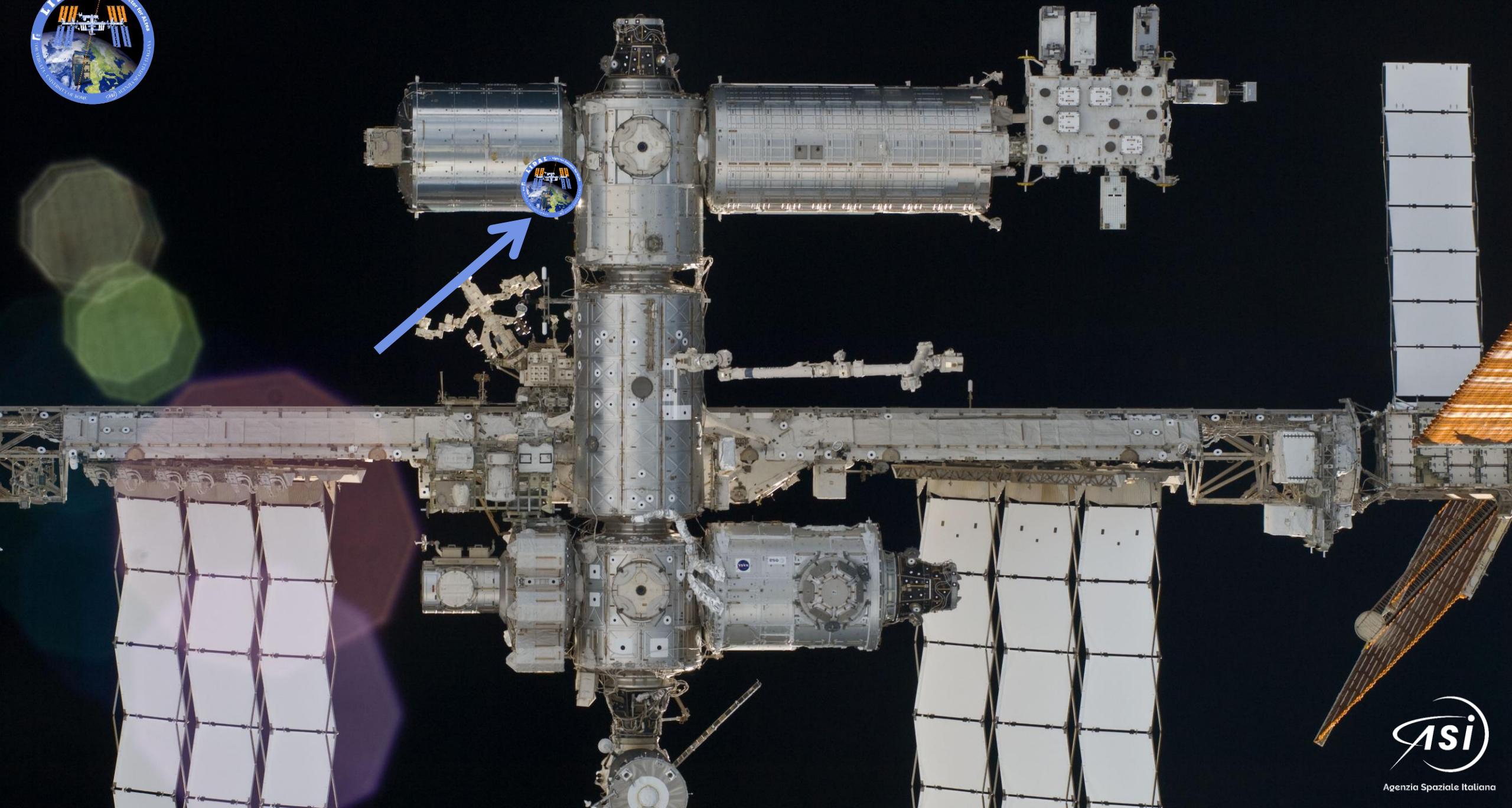
TOF
(Time Of Flight)
system

2 LDUs:

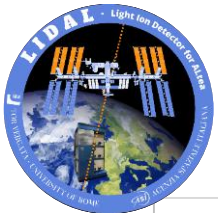
- 8+8 fast
scintillator
bars
- 100 ps
resolution

Extended
sensitivity
(p, He)
Independent
estimate of
kinetic energy

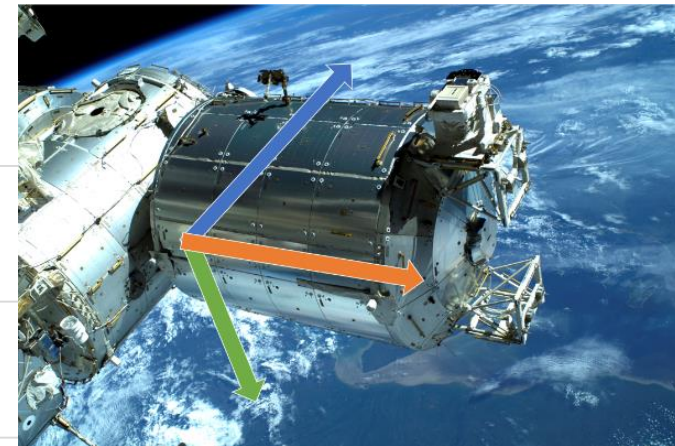
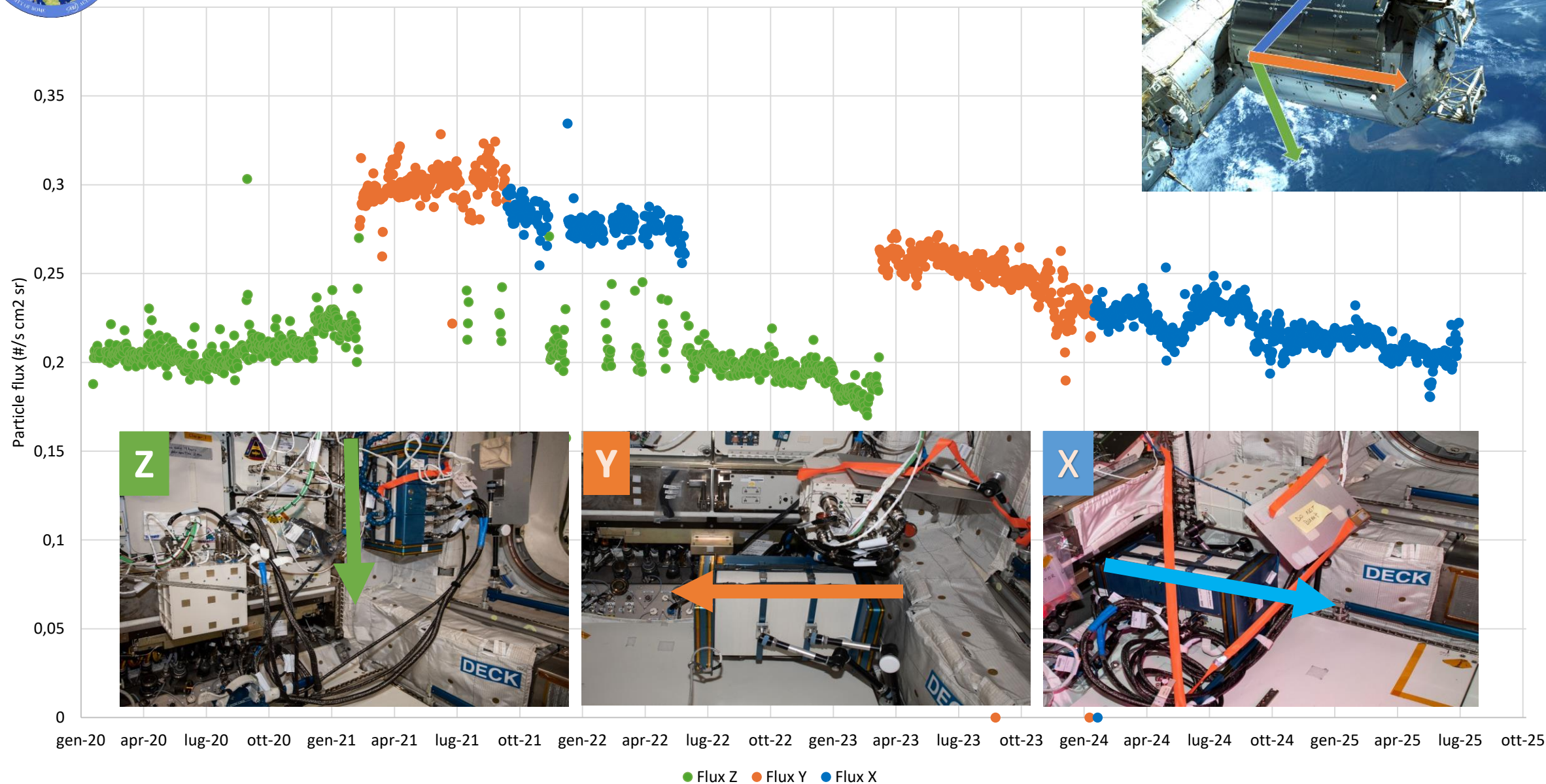




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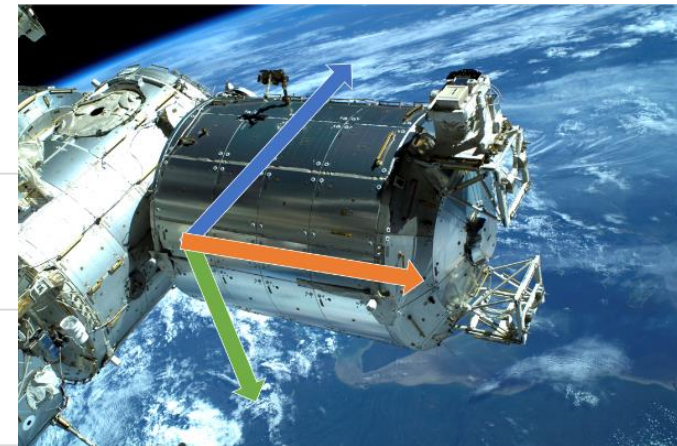
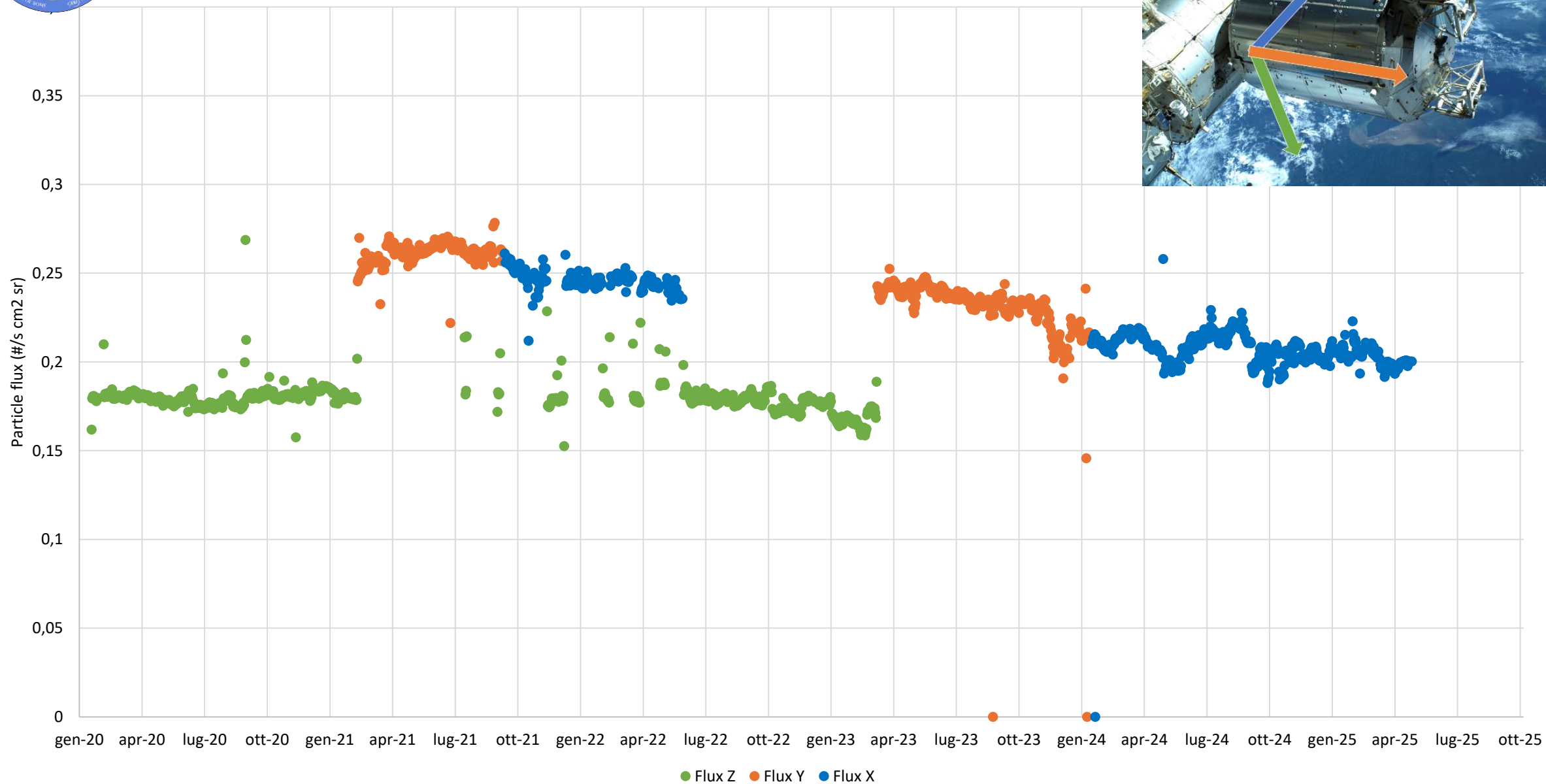


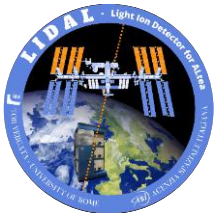
Daily particle flux (Full orbit)



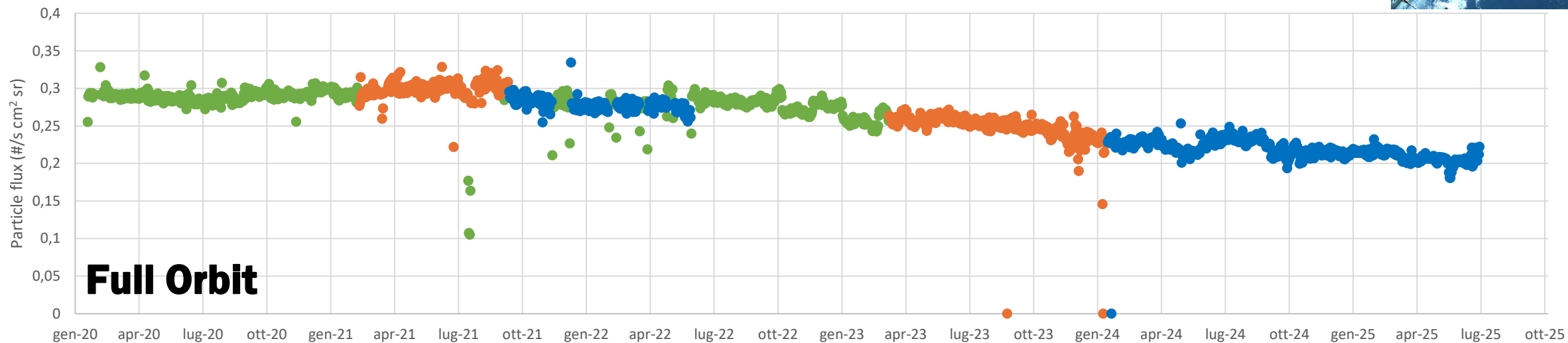
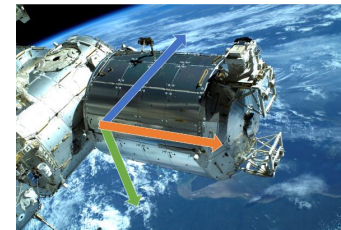


Daily particle flux (GCR)

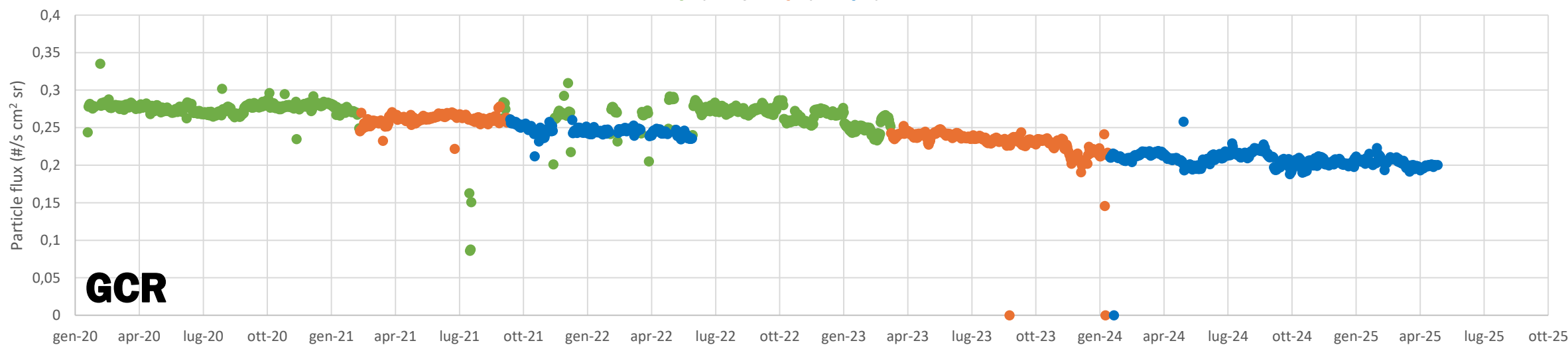




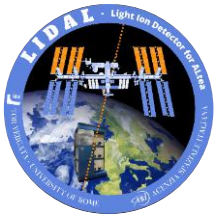
Daily particle flux (no Earth-Shadow)



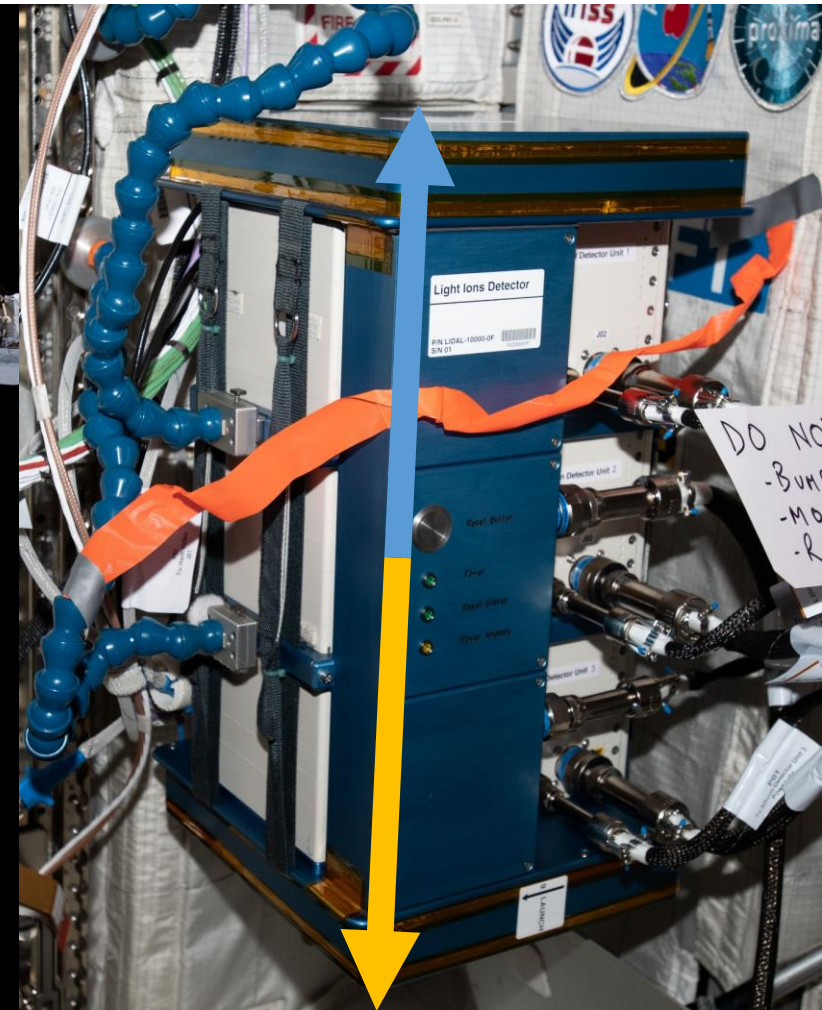
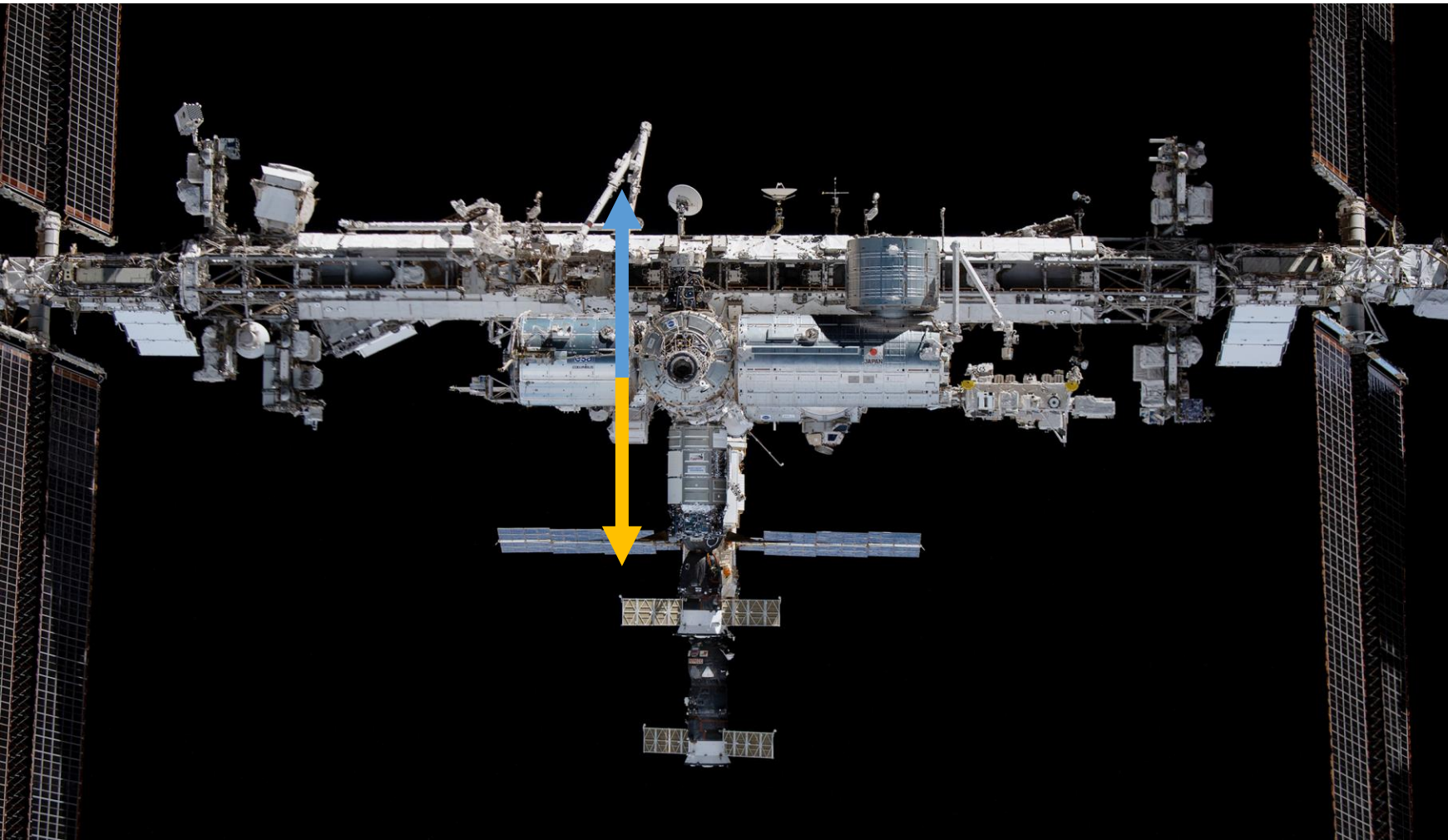
● Flux Z Down ● Flux Y ● Flux X



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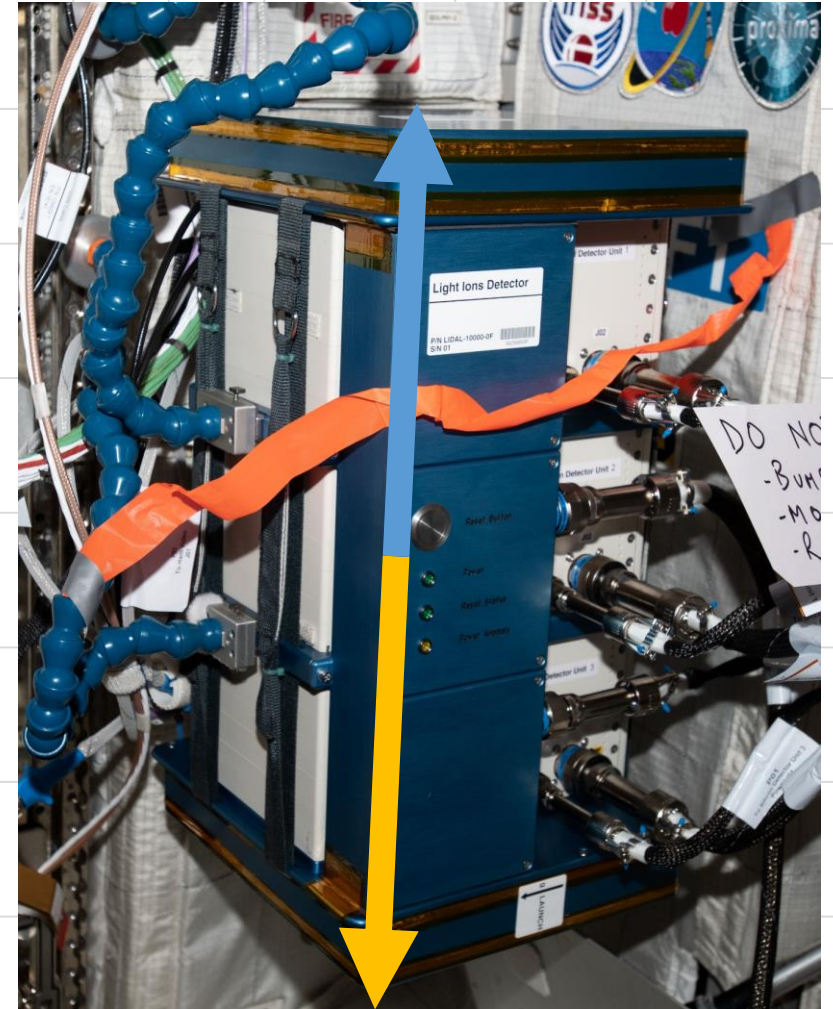
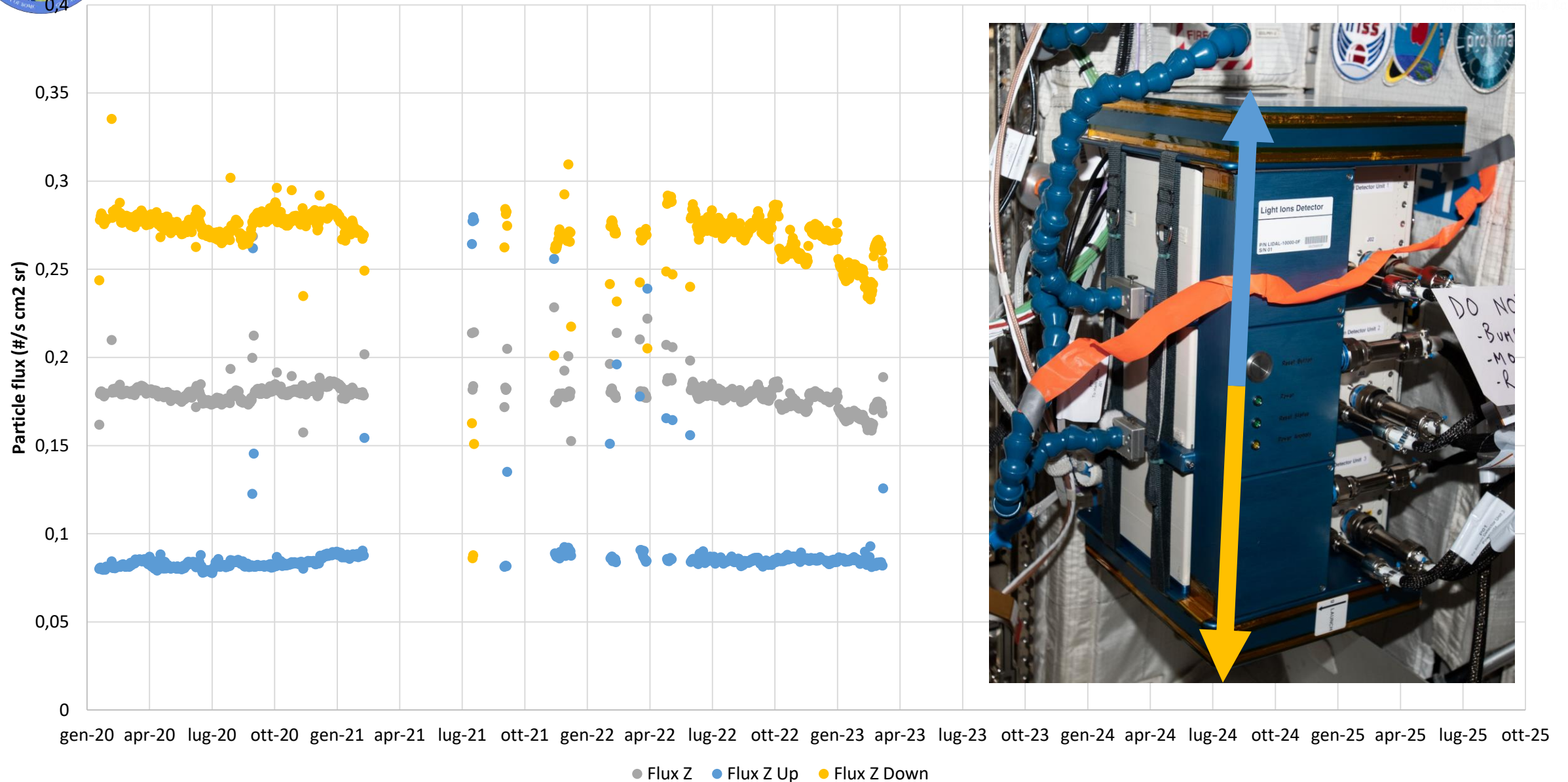


Z direction



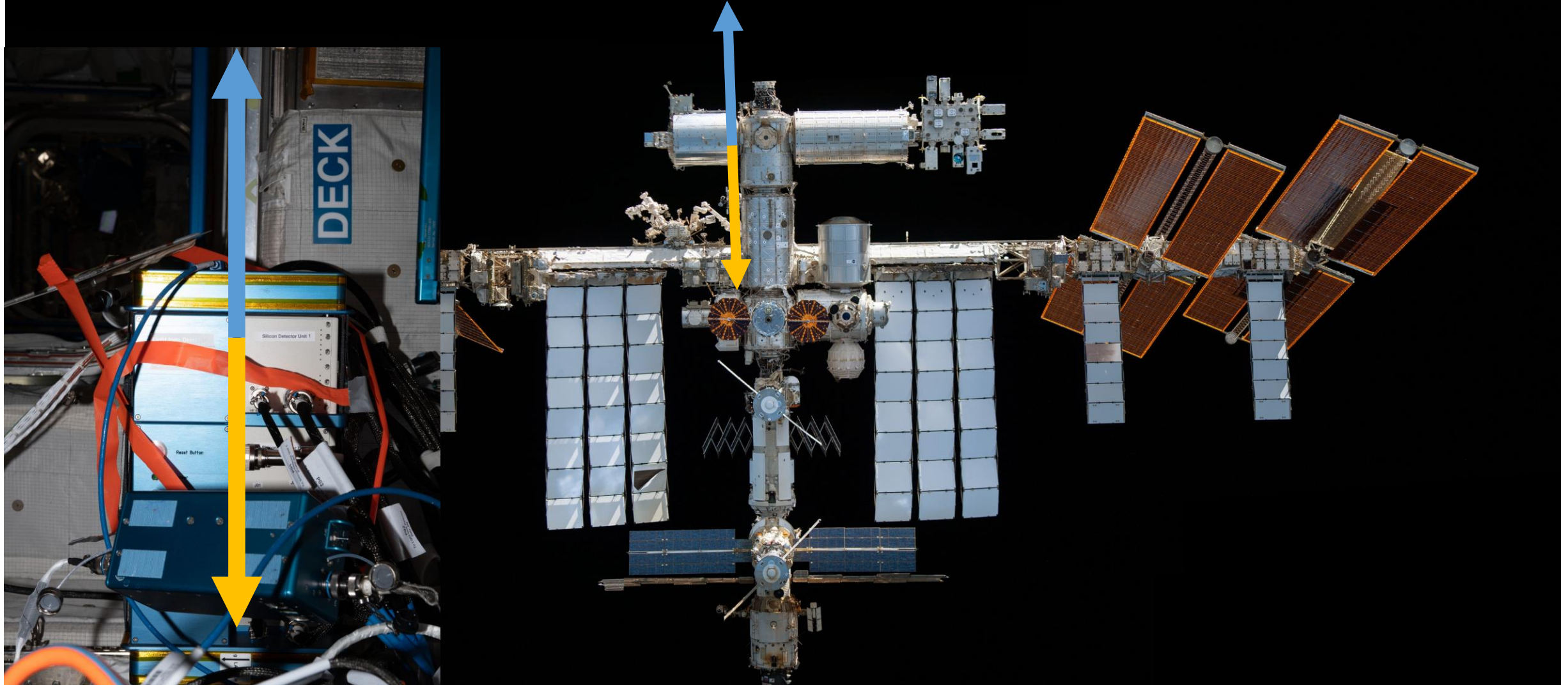


Daily flux Up-Down (GCR) - Z direction



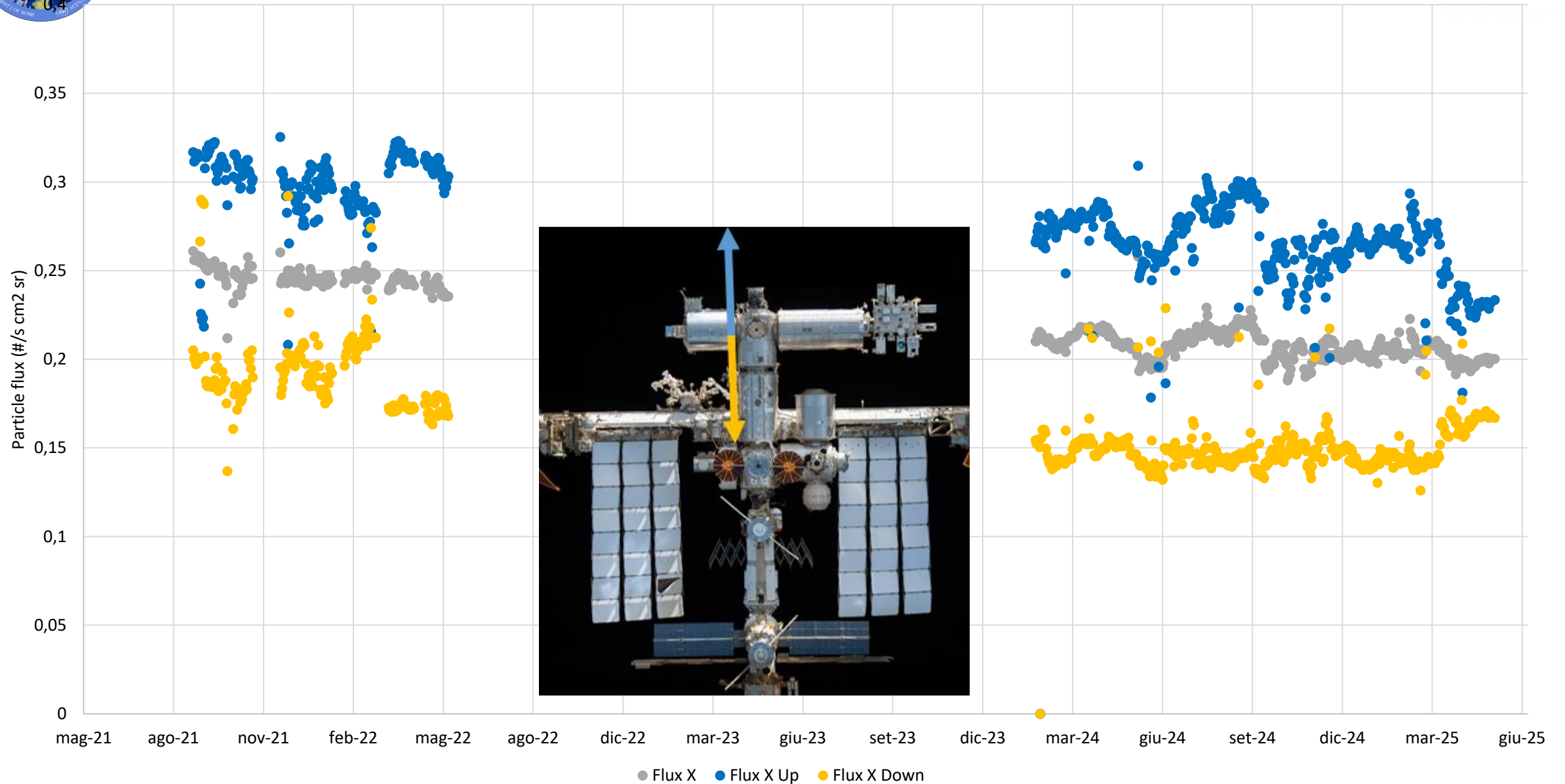


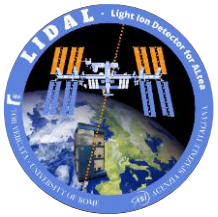
X direction



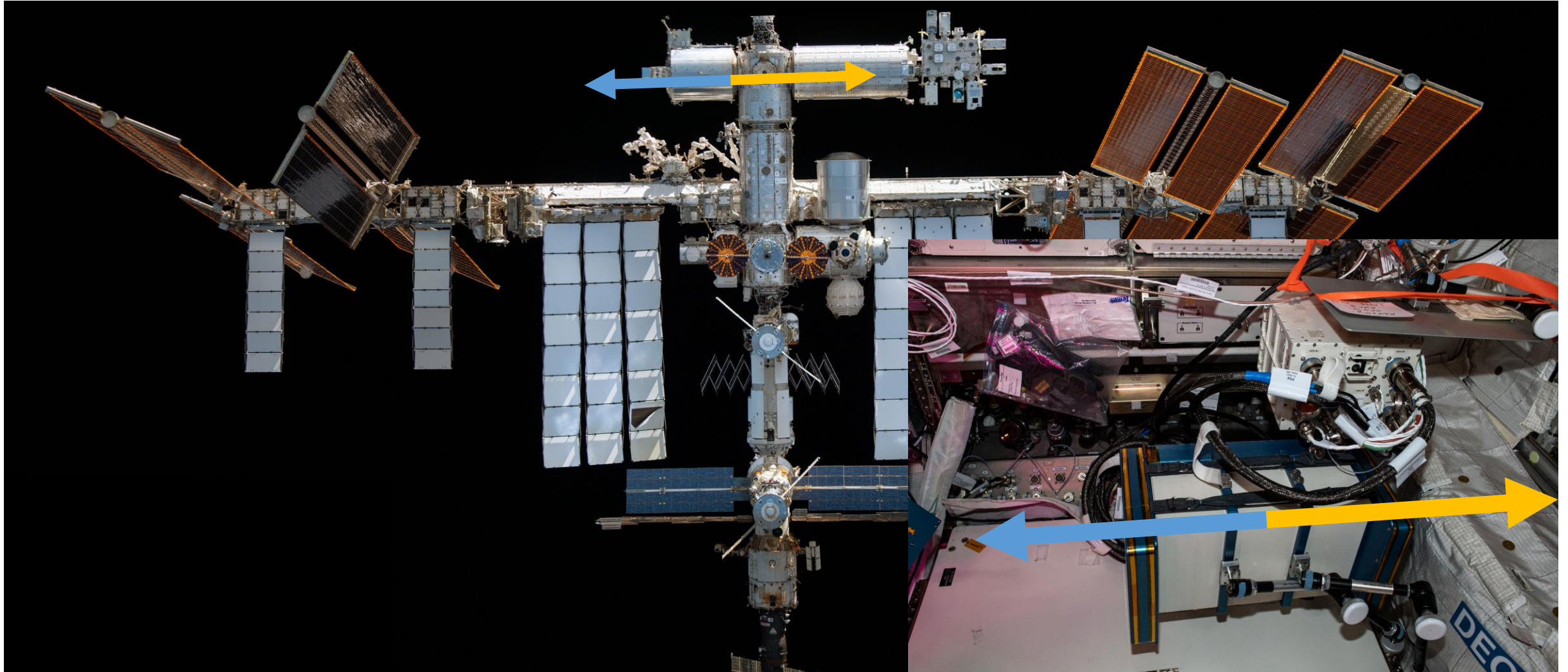


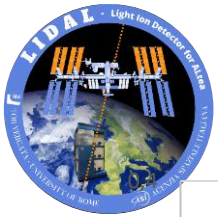
Daily flux Up-Down (GCR) - X direction



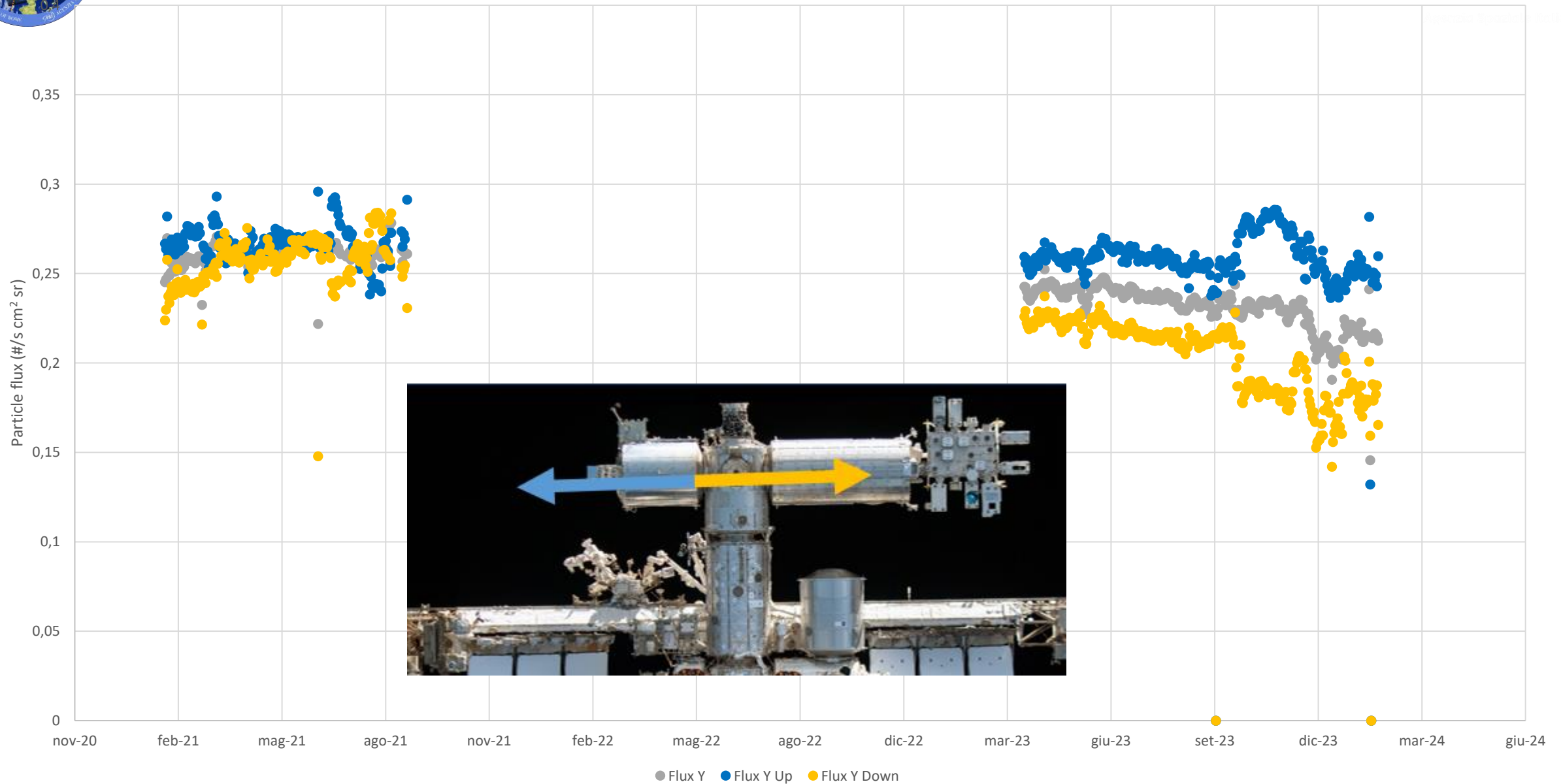


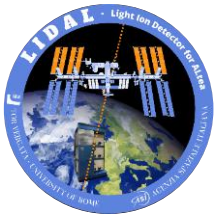
Y direction



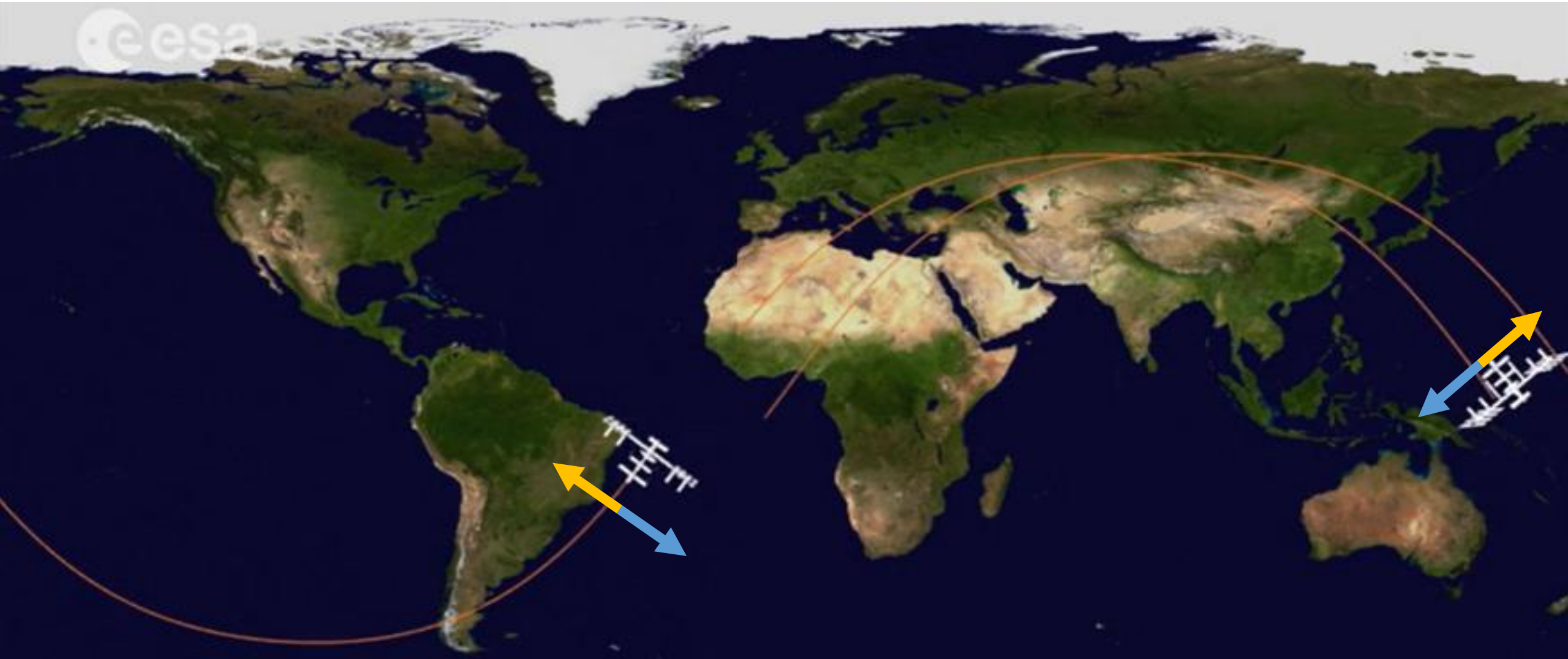


Daily flux Up-Down (GCR) - Y direction





Y direction

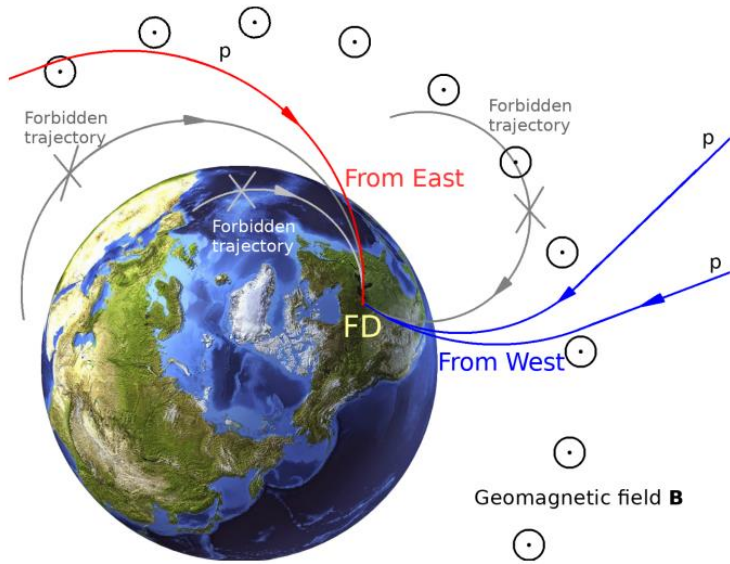


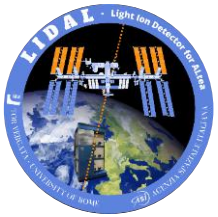


Y direction – East-West asymmetry

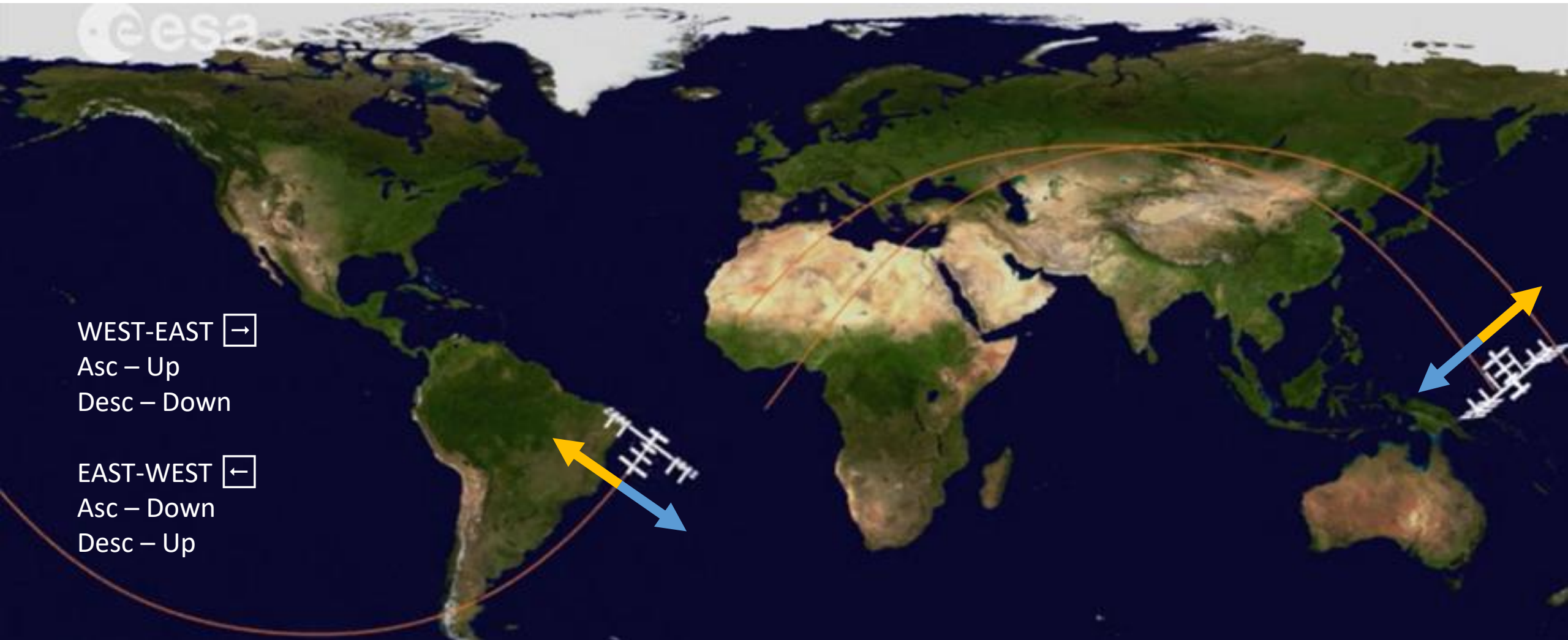


East-West Asymmetry



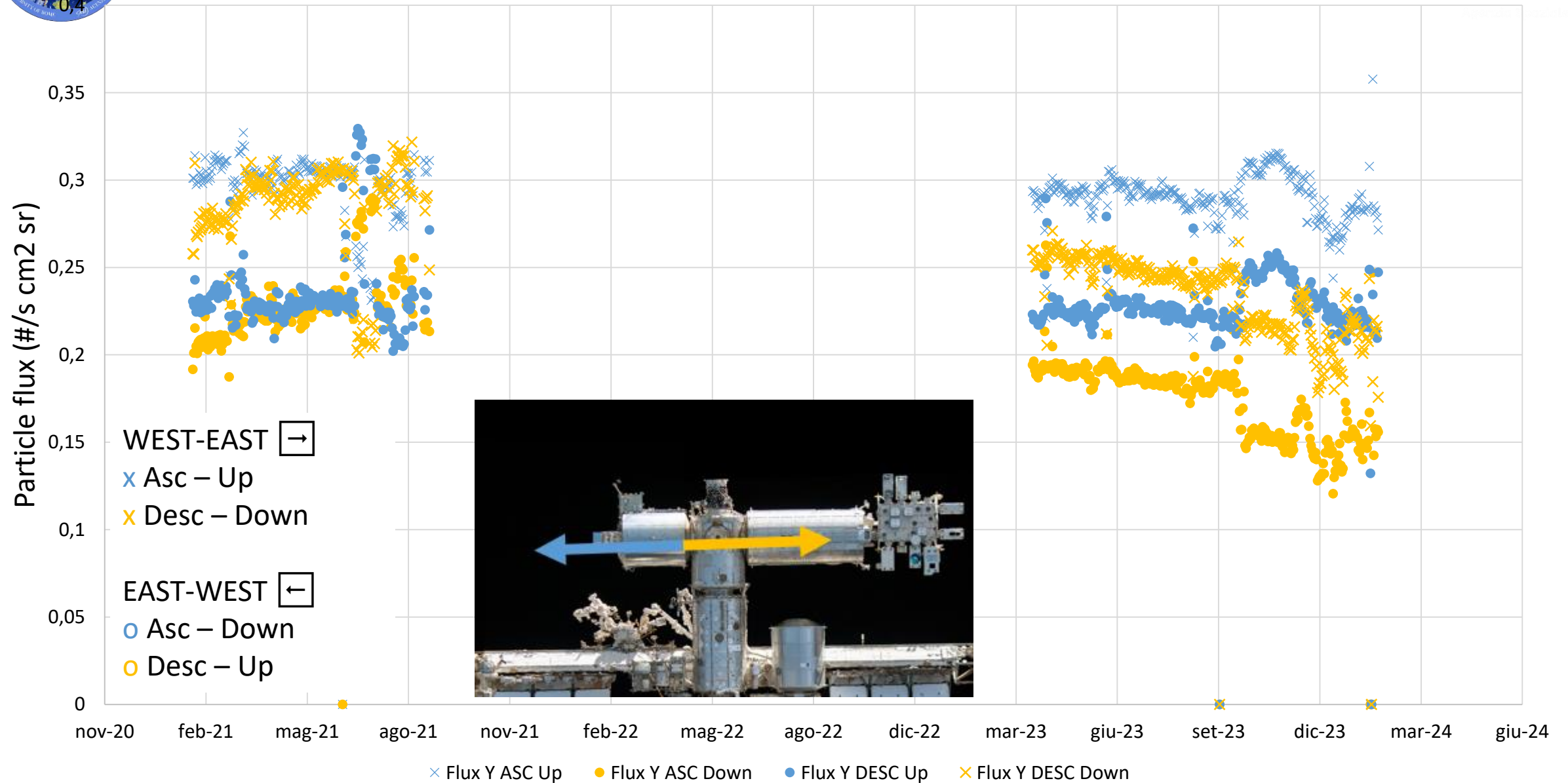


Y direction – East-West asymmetry



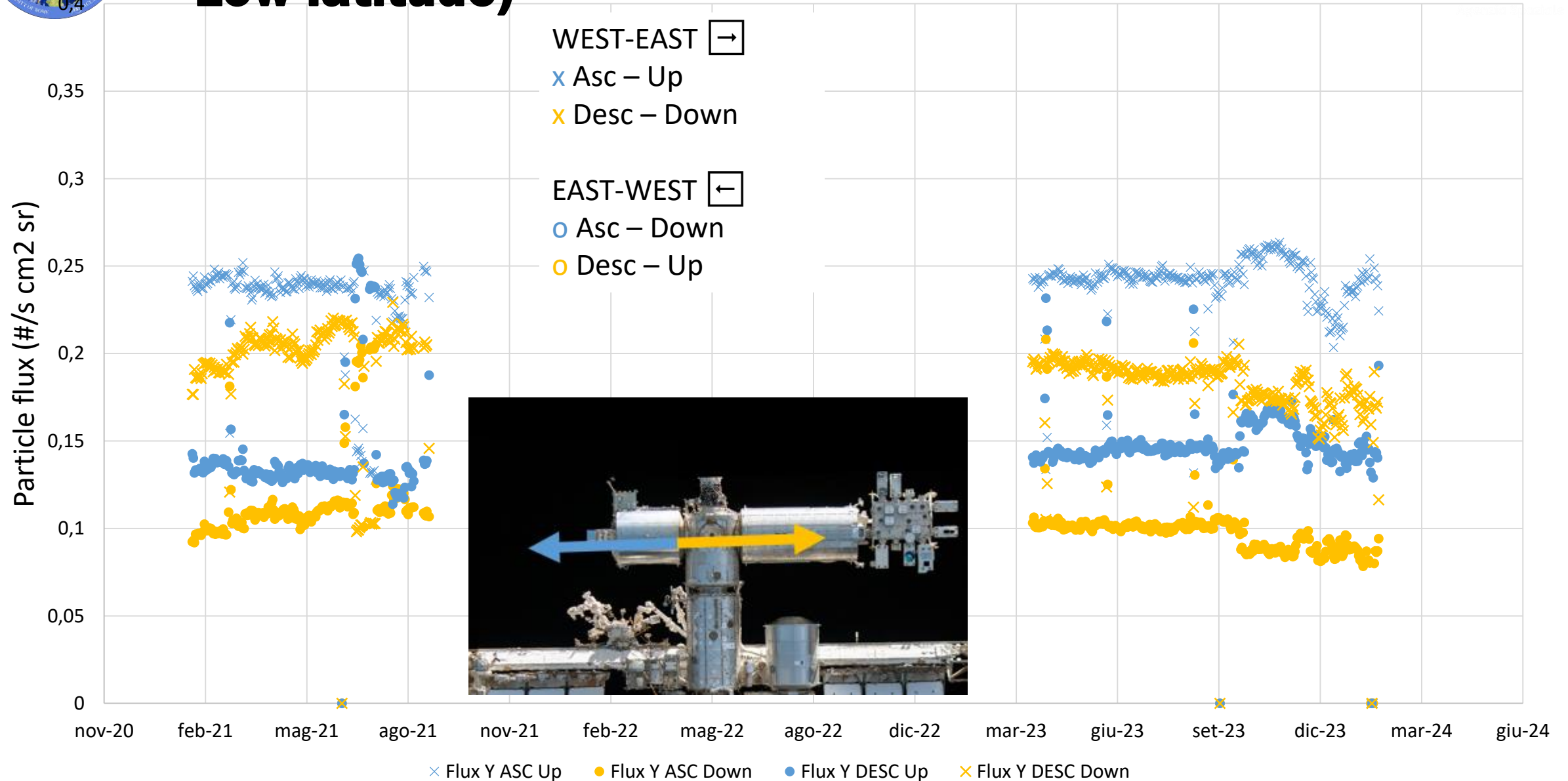


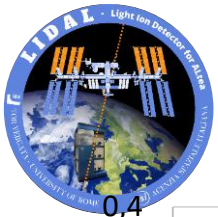
Particle Flux - East-West effect (Y direction)



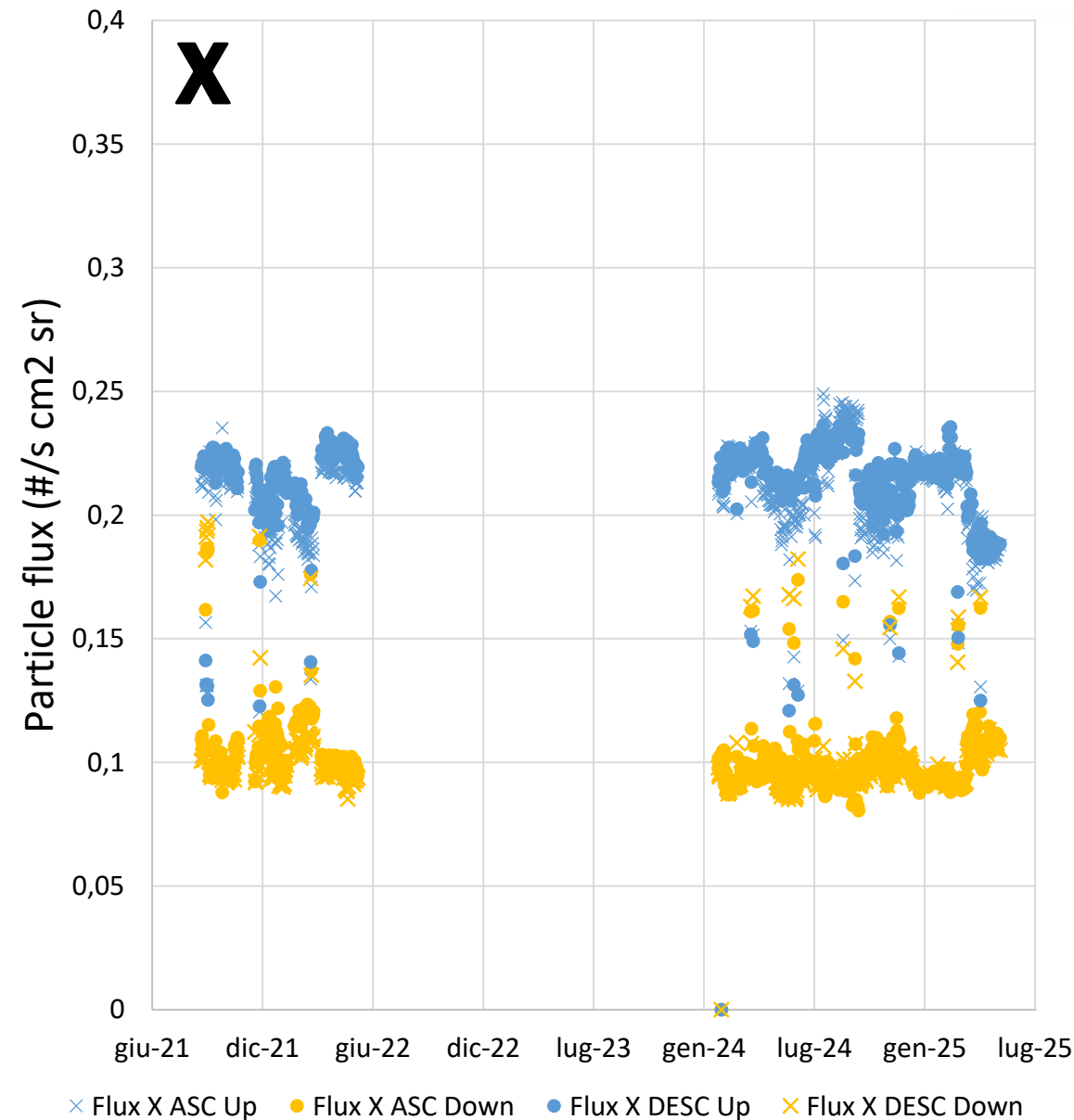
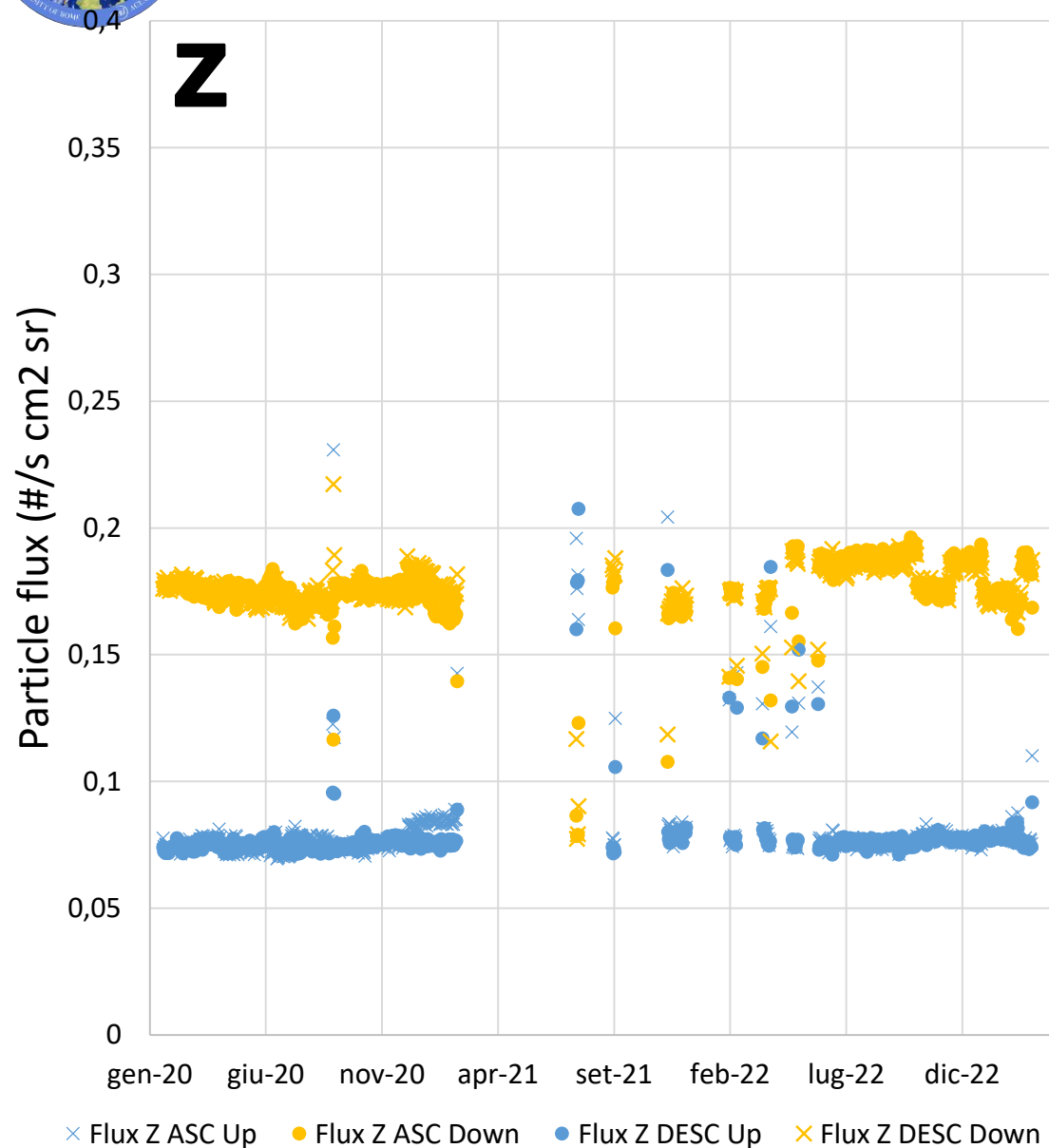


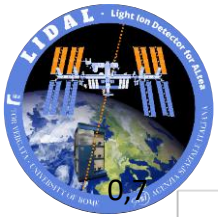
Particle Flux - East-West effect (Y direction - Low latitude)



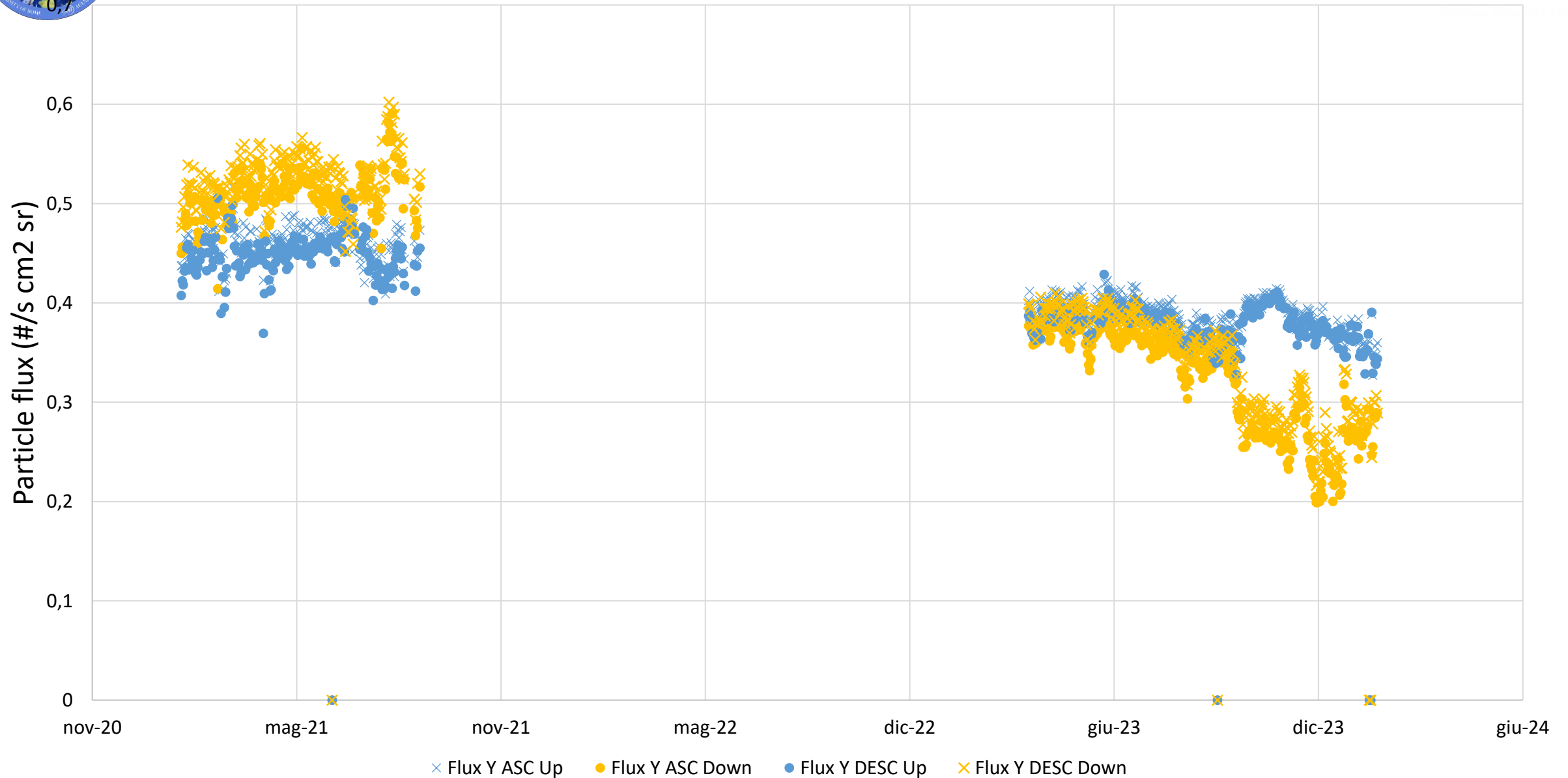


Particle Flux - (Z and X directions – Low latitude)



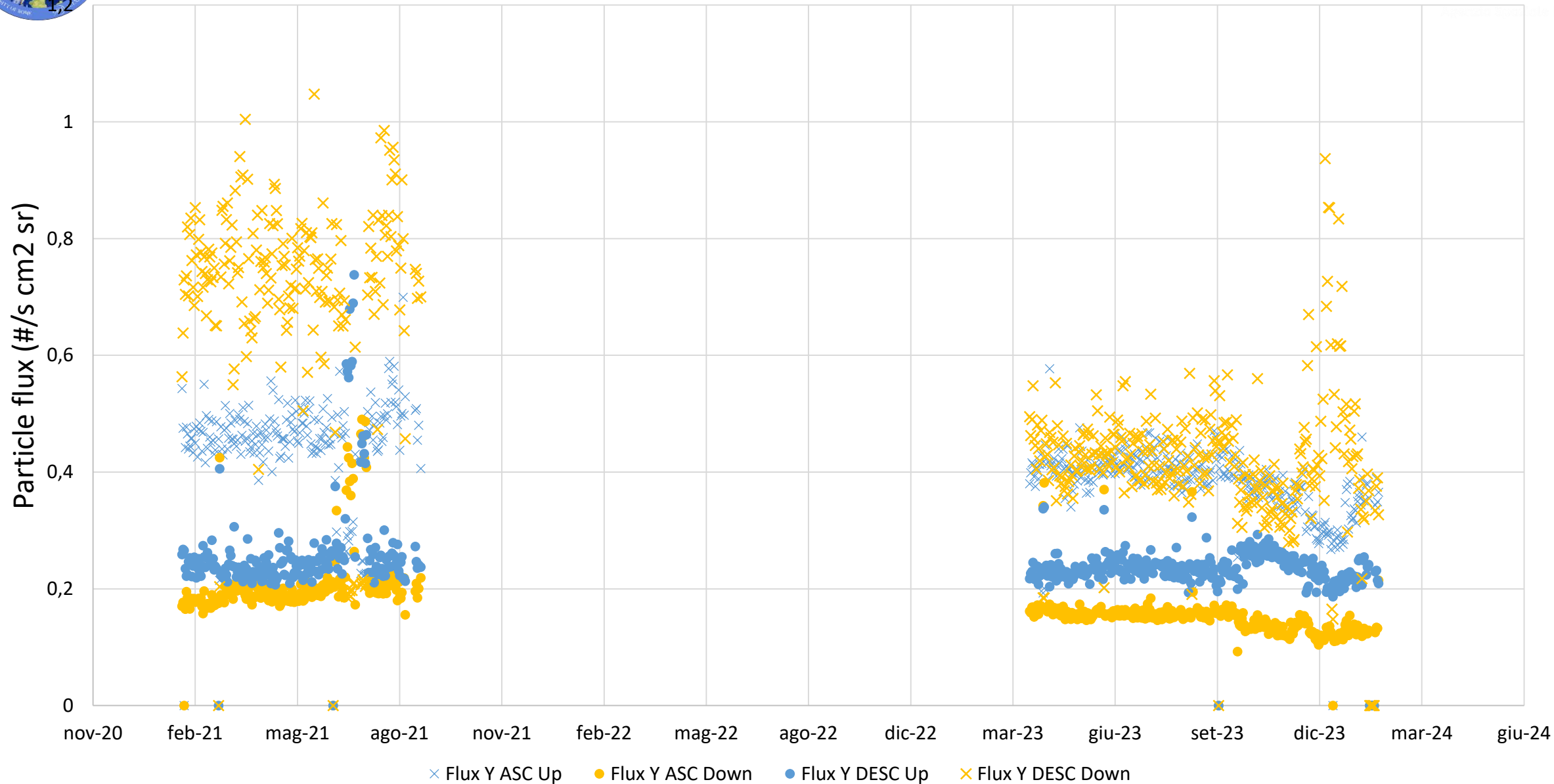


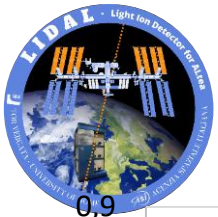
Particle Flux - (Y direction - High latitude)



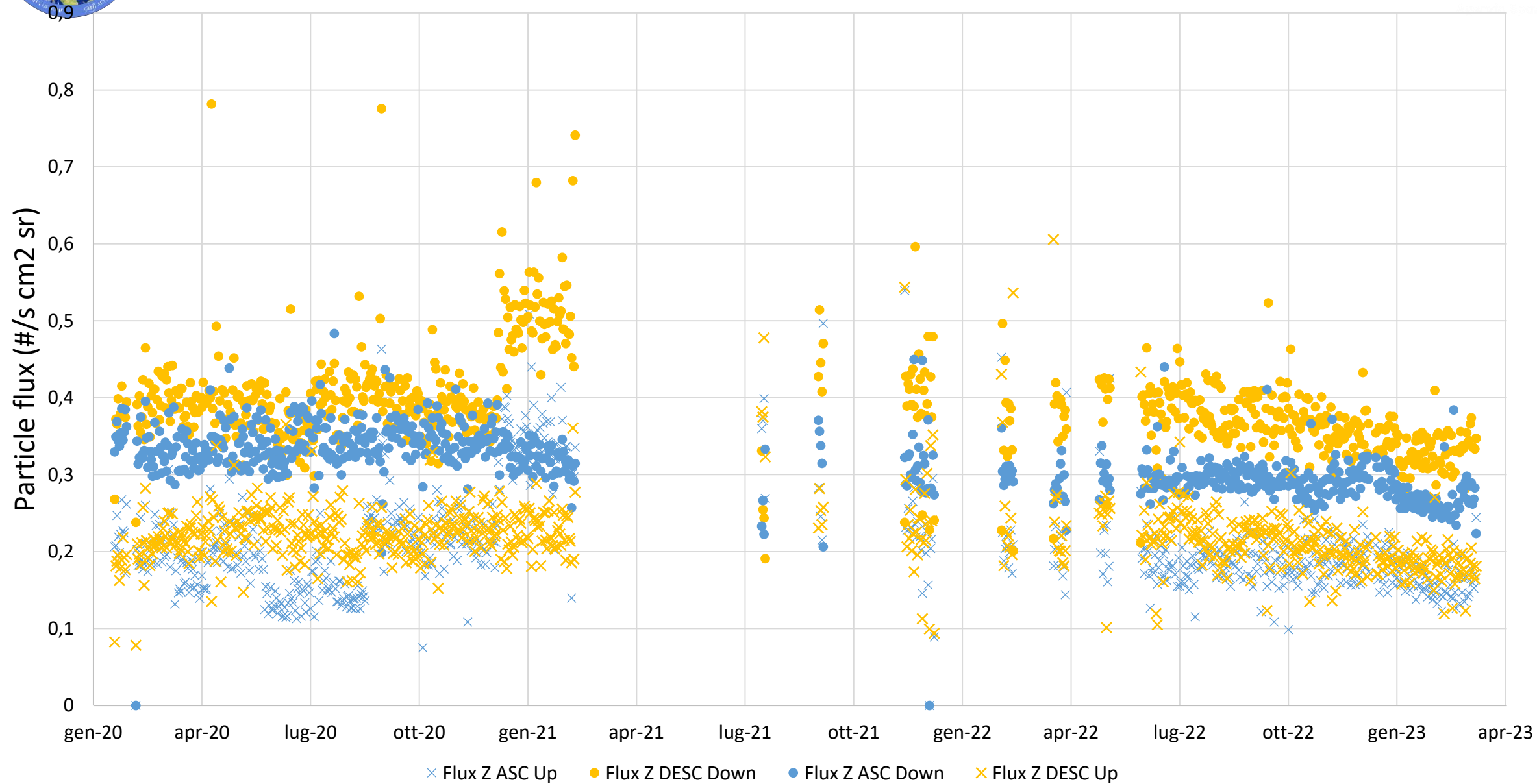


SAA Anisotropy (Y direction)



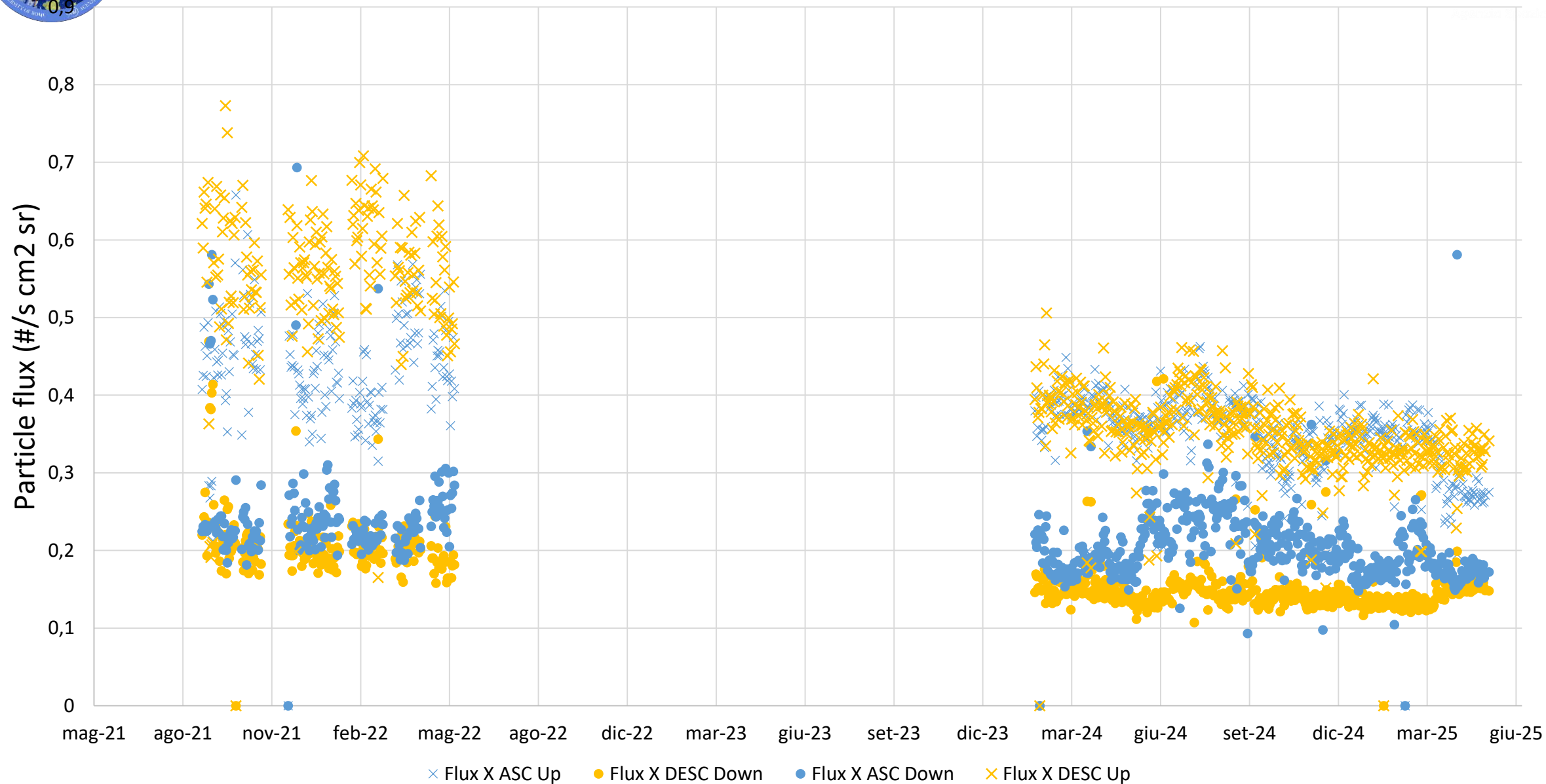


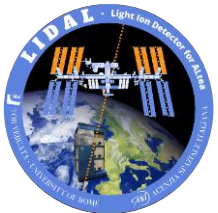
SAA Anisotropy (Z direction)



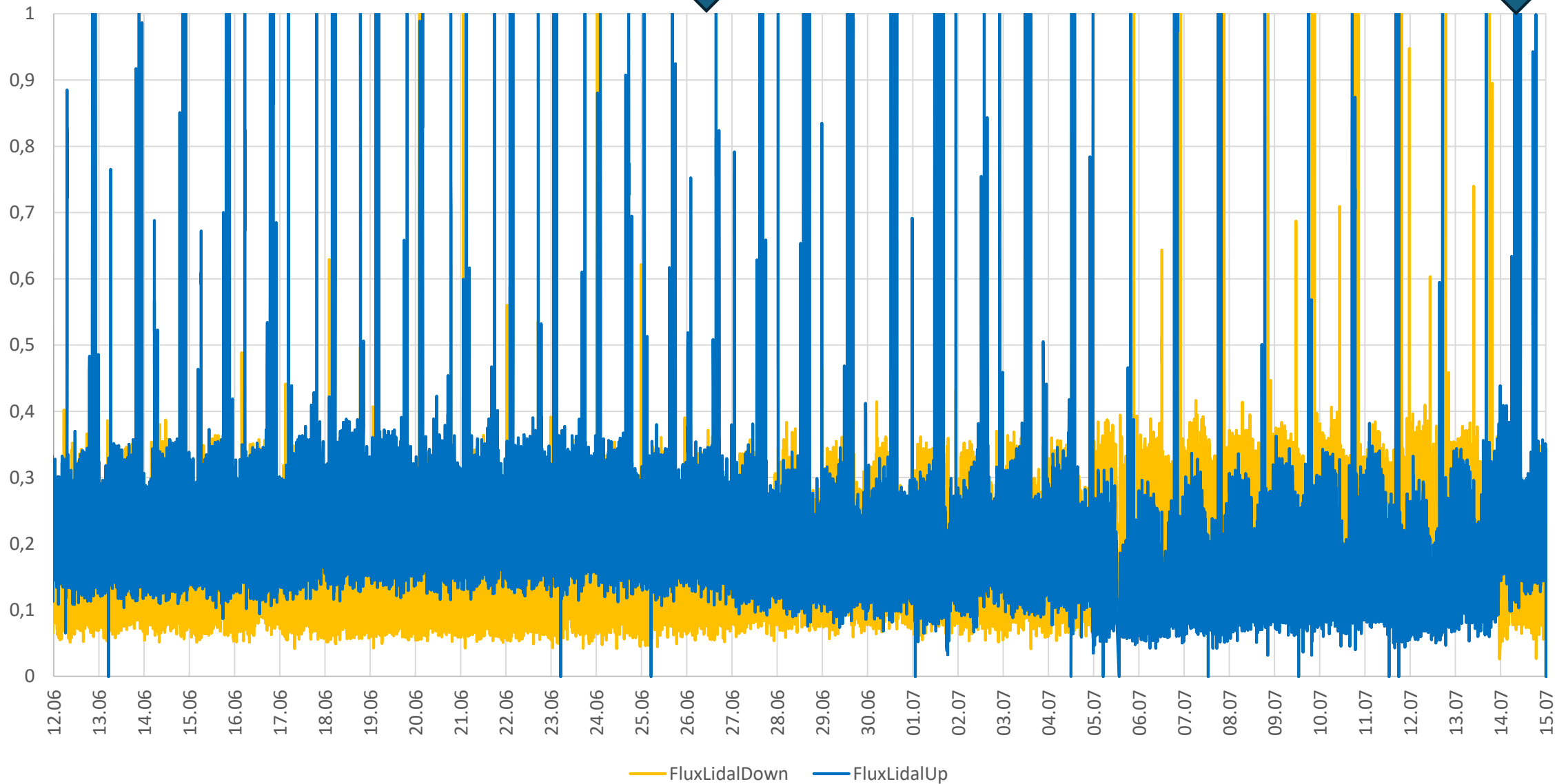


SAA Anisotropy (X direction)





Axiom4





Takeaways



- Radiation is not isotropic
- Uneven mass distribution produces strong anisotropies
- Transport model development needs accurate measurements
- Hidden angle-dependent efficiency of a detector could lead to systematic errors in measurements.



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**Thank you for
your kind
attention!**

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