Real-time forecast of the IMPTAM-VERB coupled model

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Outline

1. Inputs
   - IMPTAM-forecast
   - Kp-forecast

2. Real-time processing of IMPTAM output

3. VERB-3D simulations in real-time

4. IMPTAM-VERB forecast

5. Flowchart

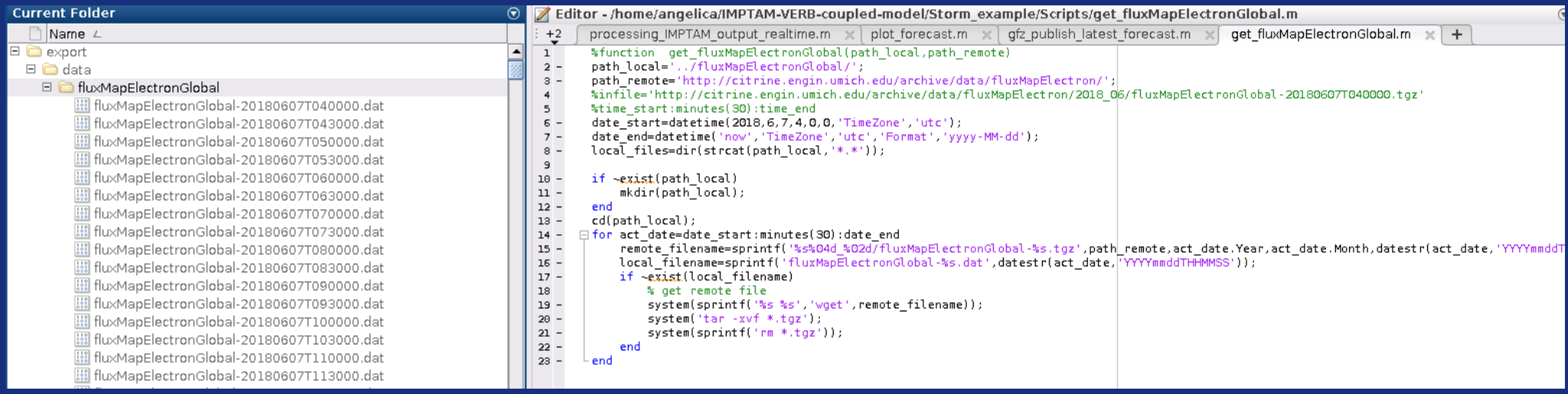
Inputs: IMPTAM-forecast

Real-time IMPTAM nowcast

Output files were available every 30 minutes (1 hour) at:

http://citrine.engin.umich.edu/archive/data/fluxMapElectron/

Data is being uploaded automatically via cronjob



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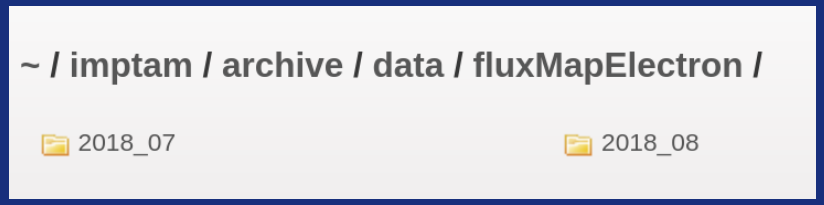
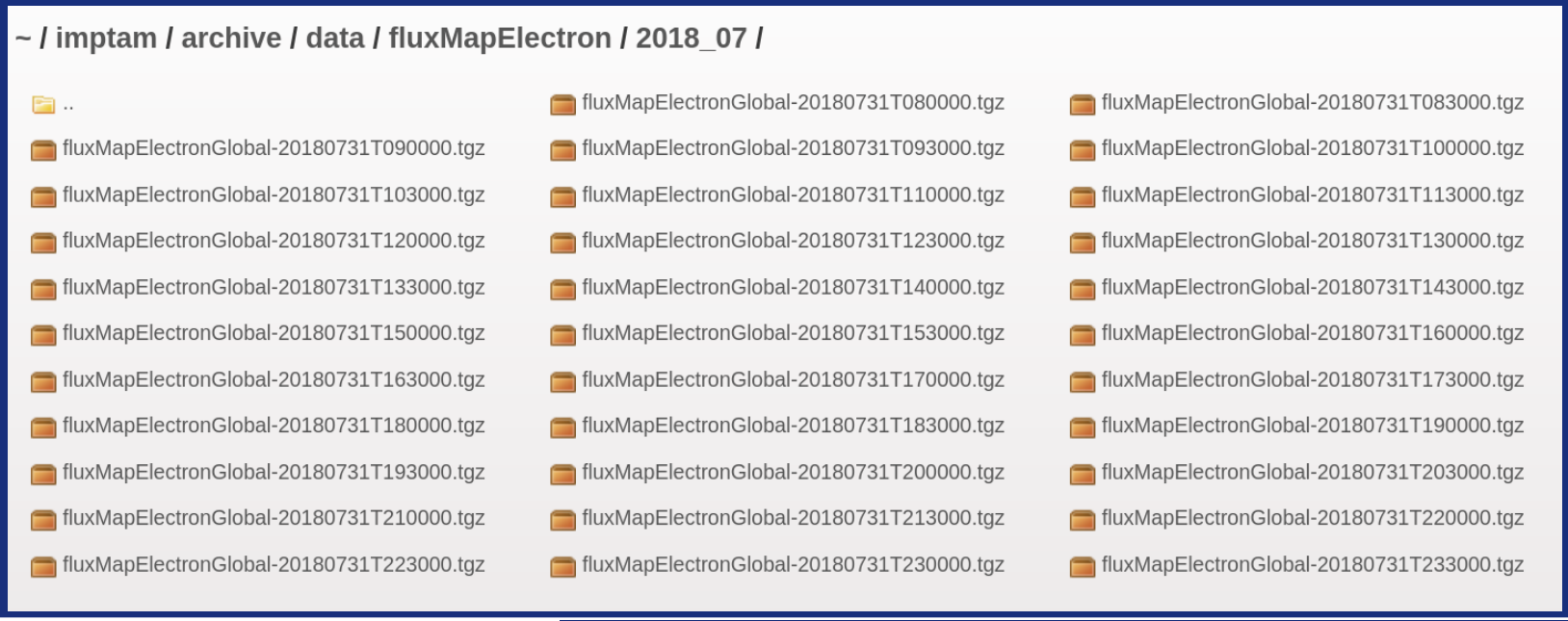
PROGRESS

Inputs: IMPTAM-forecast

After a downtime from July 13th the output files are now available every 30 minutes (1 hour) at:

http://citrine.engin.umich.edu/imptam/archive/data/fluxMapElectron/





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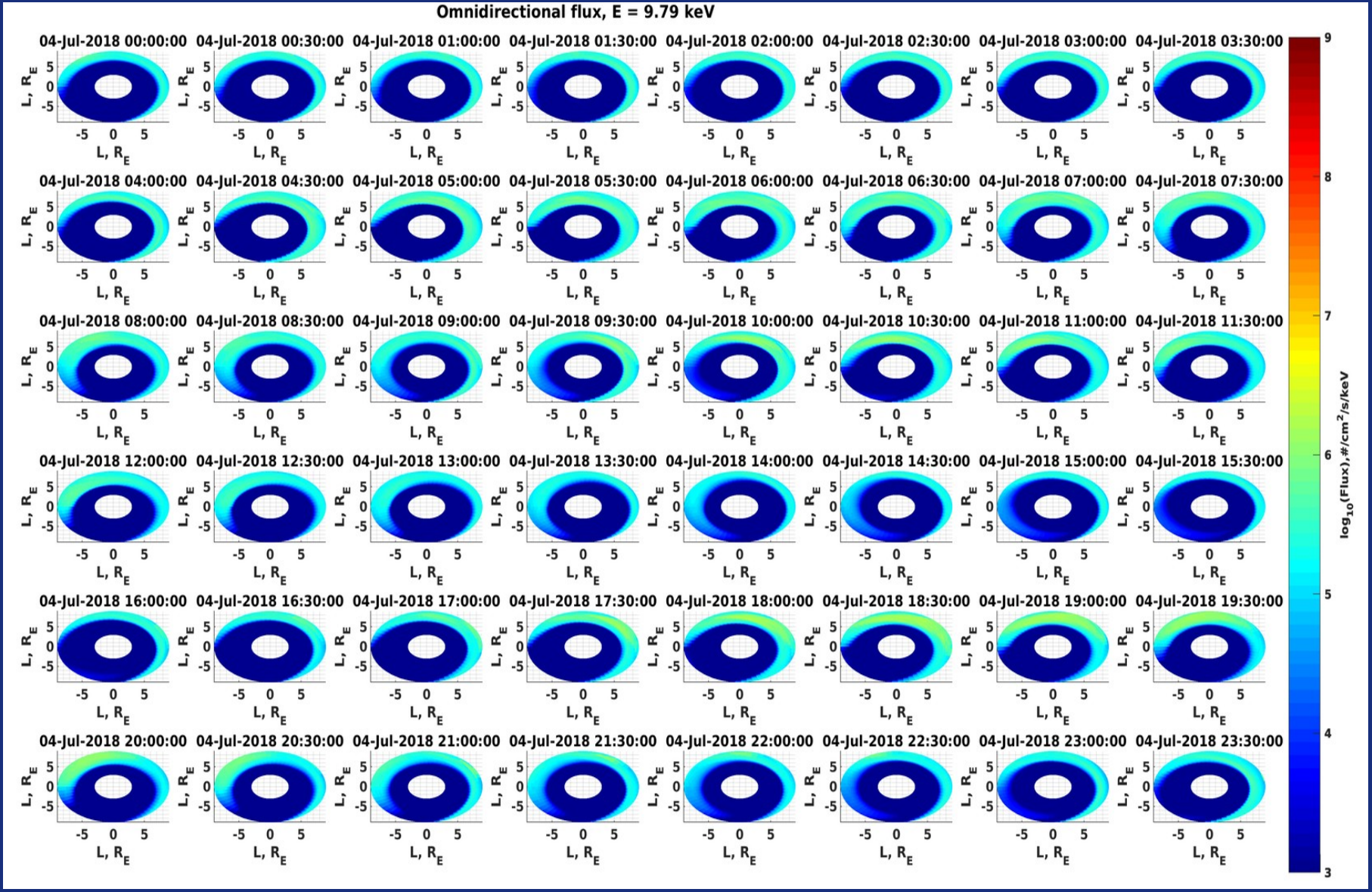
Inputs: IMPTAM-forecast



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Inputs: Kp-forecast

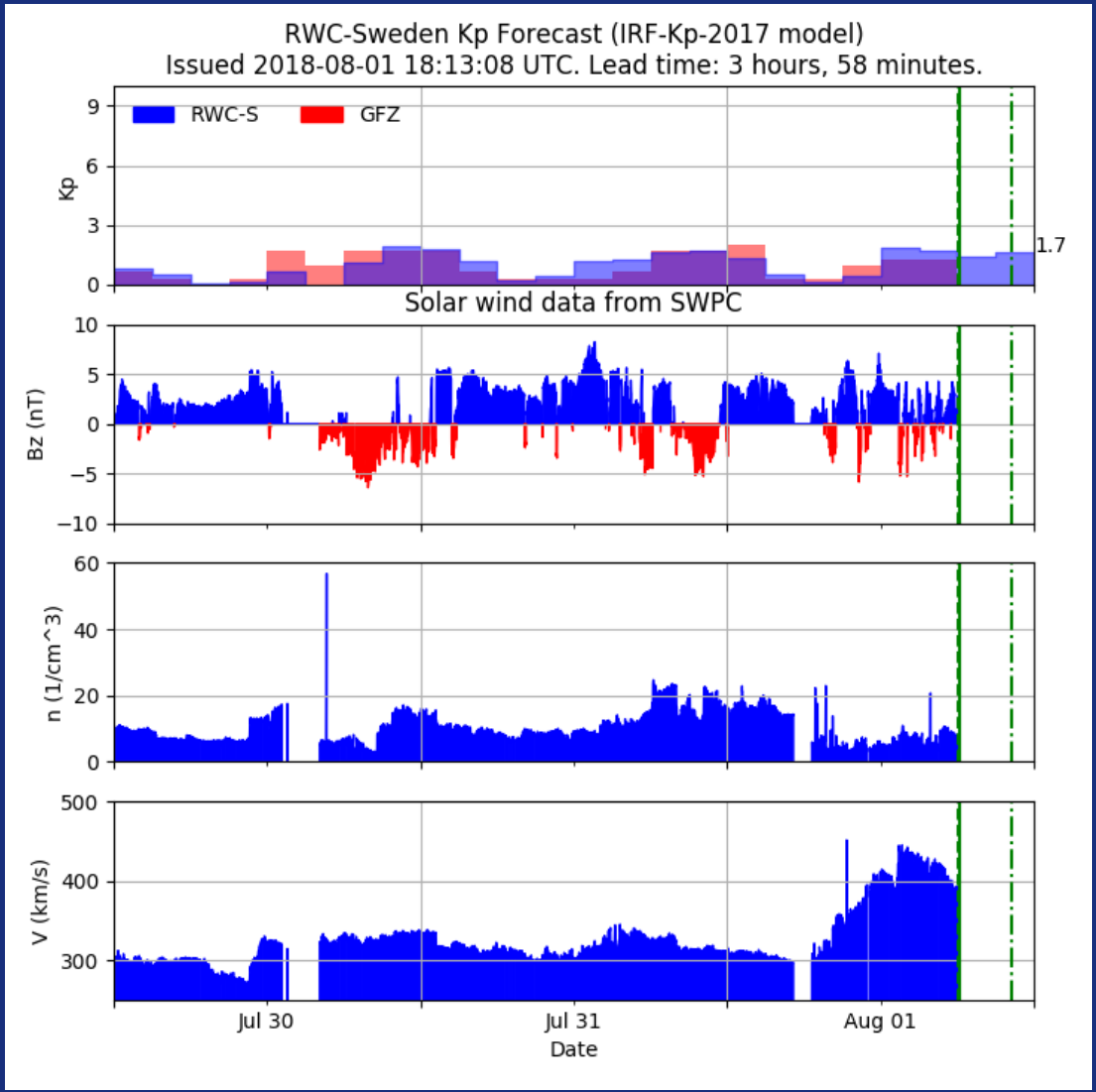
IRF-Kp-2017 model from Lund

Kp-prediction using solar wind parameters

Needed in VERB for the calculation of the plasmapause location and for the scaling of the diffusion coefficients.

Download of value every 3 hours into a dynamic array of 6*8-hour values

Available at: http://lund.irf.se/progress/rest/datasets/irfkp2017



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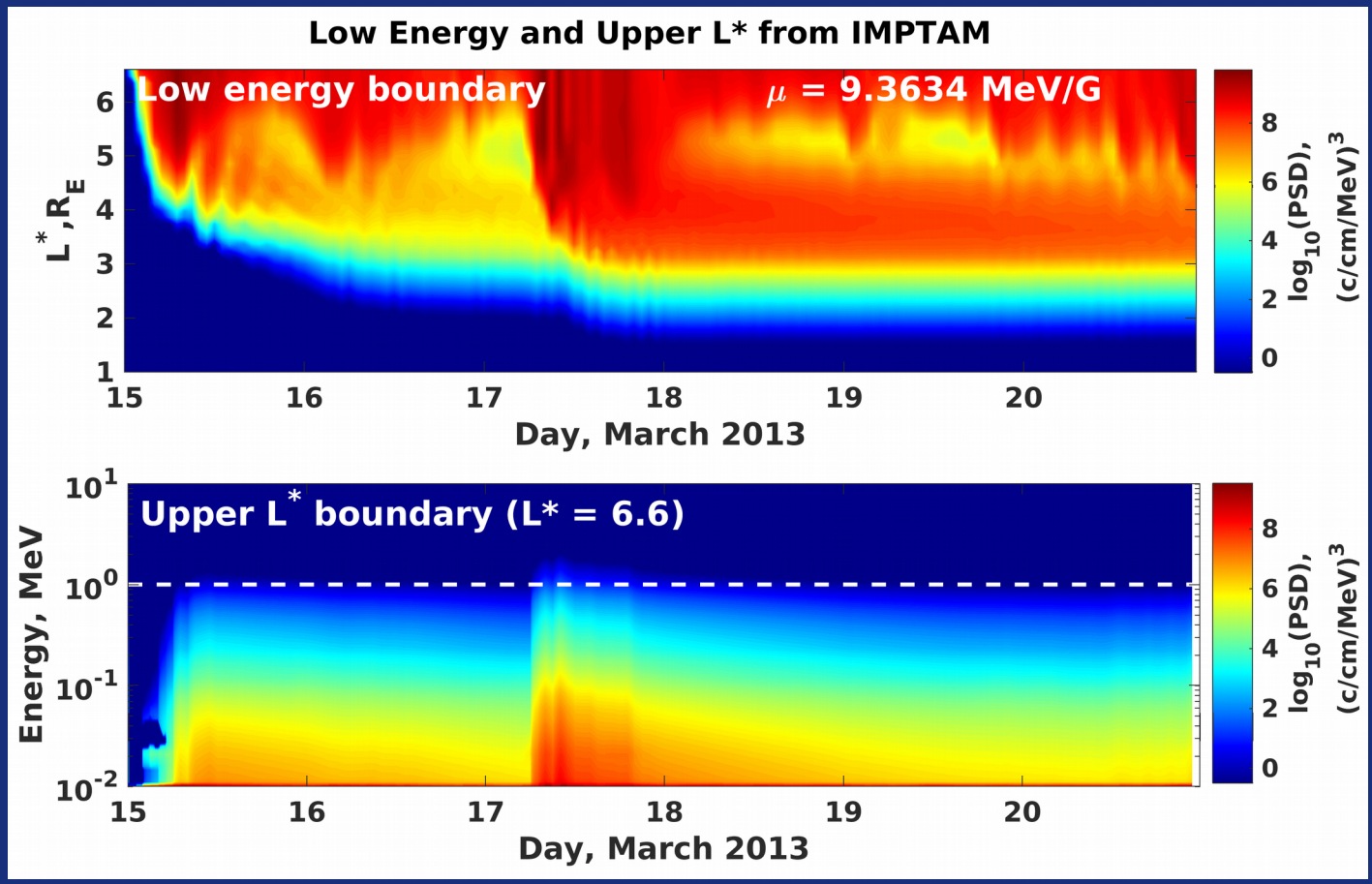
Processing of the IMPTAM output

Check if IMPTAM files have correct format

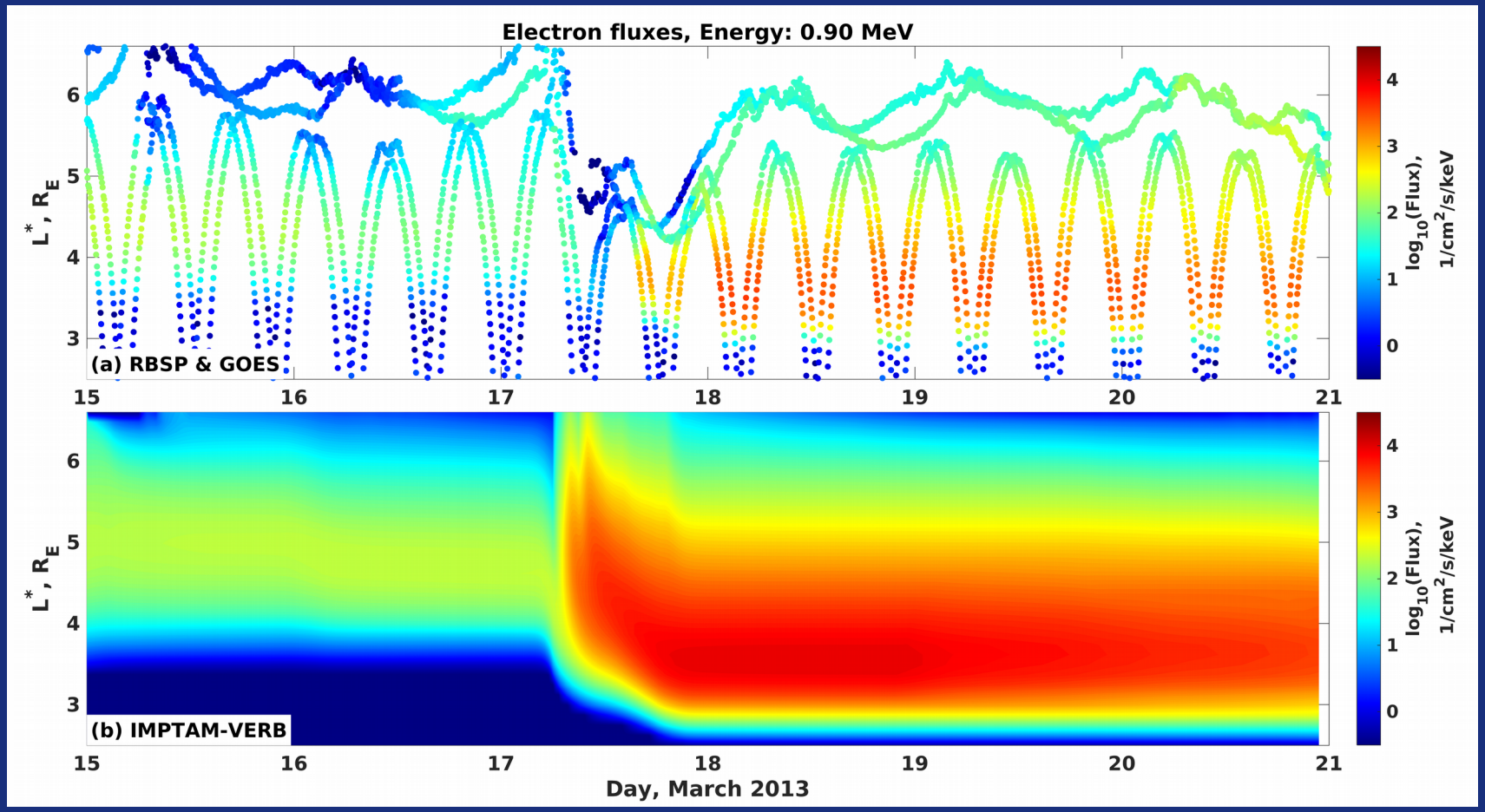
MLT-averaging, grid adaptation

Calculation of the low energy boundary and the outer boundary necessary to run the VERB 3D code every 30 minutes. Using IMPTAM output

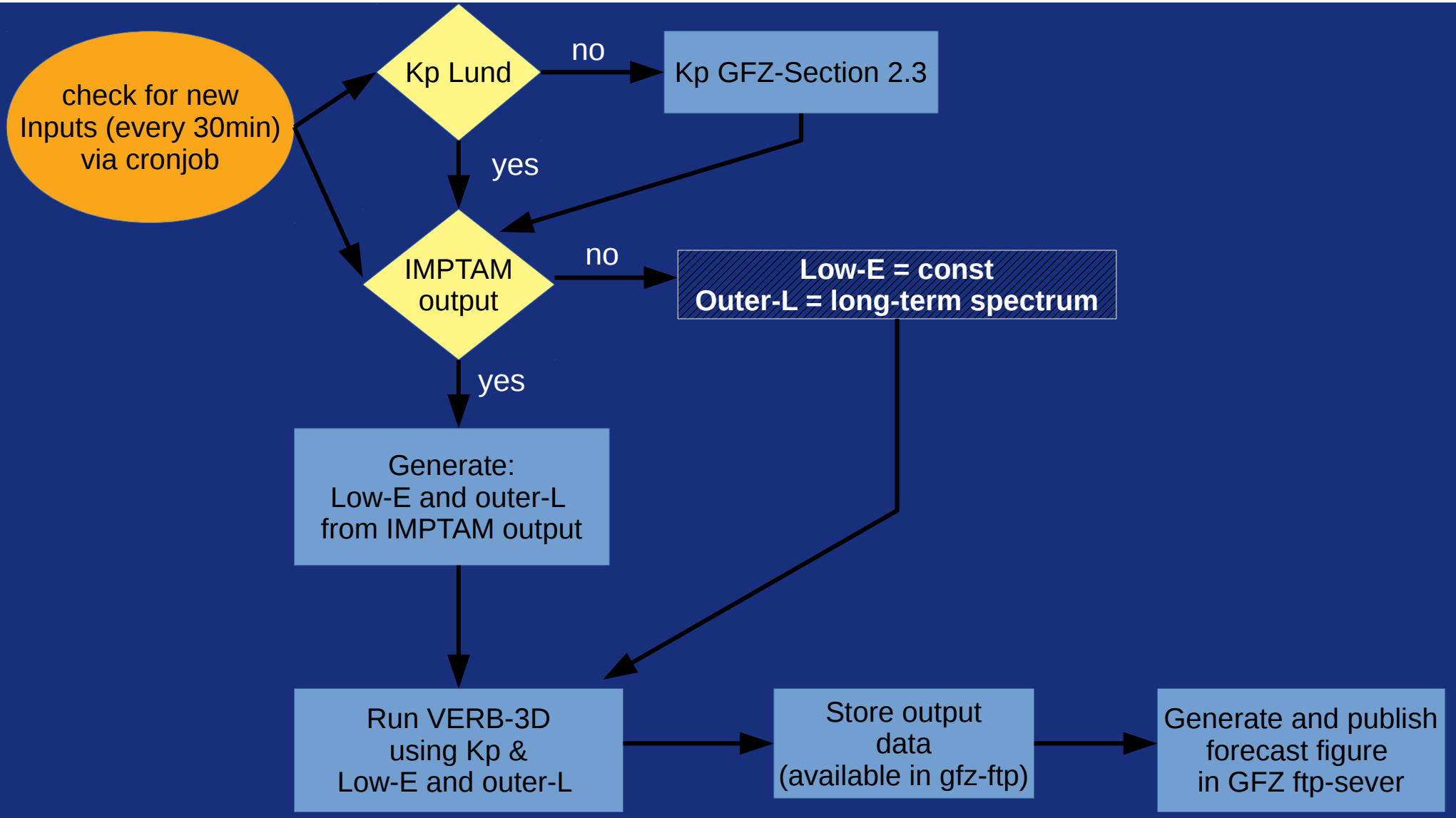


VERB simulations

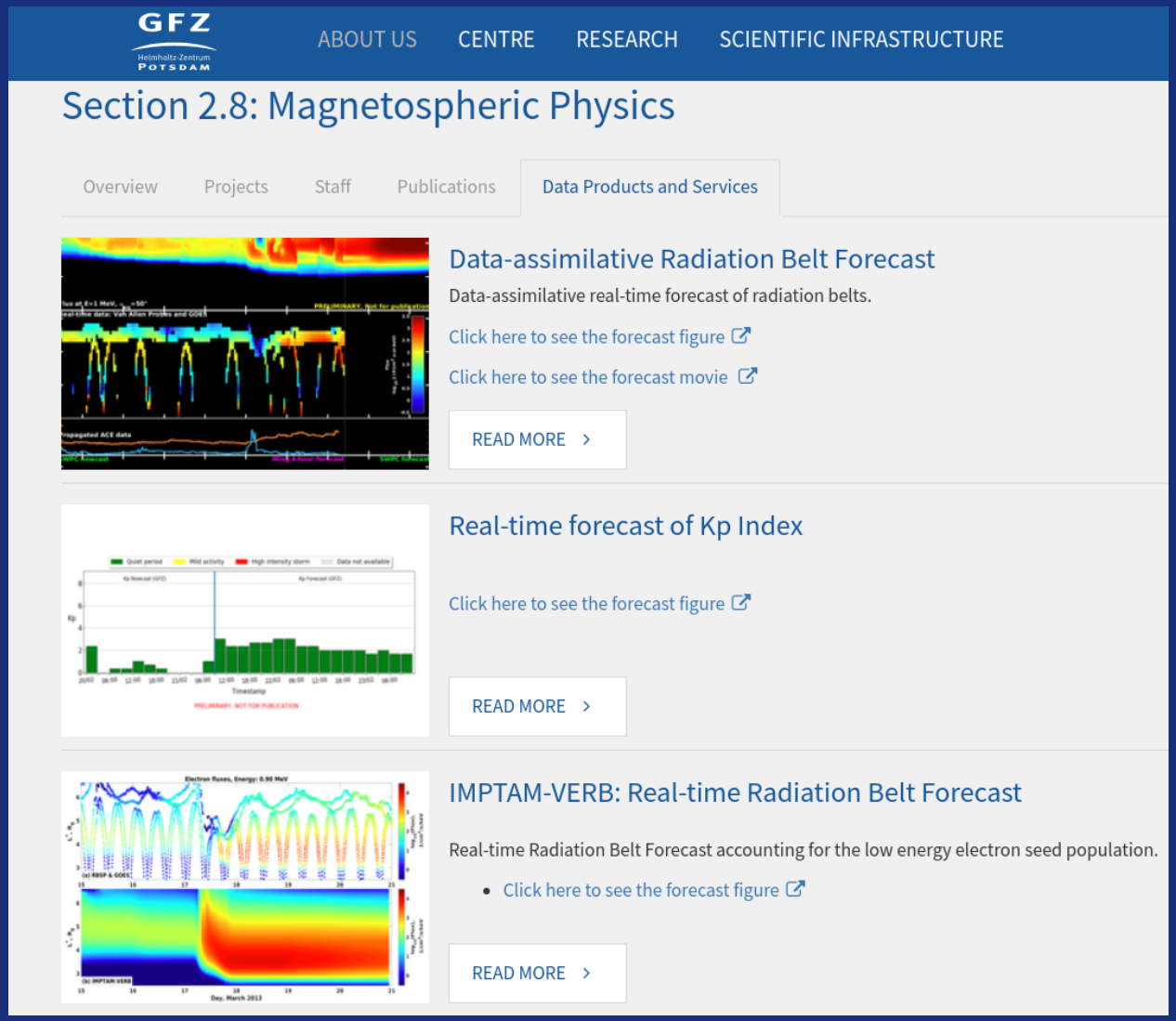
– Run VERB simulation
– Store electron flux data in the gfz-ftp server
– Update flux figure and publish it on the gfz-website



Flow diagram



Forecast publicly available



Hourly electron fluxes for particles at 0.9 MeV energy

Time window of 6 days

Available at: https://www.gfz-potsdam.de/en/section/magnetospheric-physics/data-products-and-services/

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Thank you !!

Inputs: Real-time Kp-forecast

Kp-prediction using neuronal networks, developed by Ruggero Vassile at the Magnetospheric Physics Section of the GFZ

Available at: https://www.gfz-potsdam.de/en/section/magnetospheric-physics/data-products-and-services/