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Supporting Information for

Model-free approach for regional ionospheric multi-instrument imaging

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Additional Supporting Information (Files uploaded separately)

Captions for Movies S1 to S2

Introduction

The accompanying movie files show reconstructions for the whole period 2018-11-09 07:00-24:00 UTC for both the synthetic simulation and the real data case as animations where each frame correspond to individual four minute analysis step.

Movie S1.

Comparison of synthetic ionospheric model presented in Section 5.2 and the corresponding TomoScand reconstruction from 2018-11-09 07:00 to 24:00 UTC. Each frame is a reconstruction of a four-minute period. The time given in the figure indicates the end point of the time interval. The electron density cross section from longitude 23° is given for the synthetic model in panel a) and for the TomoScand reconstruction in panel b). The ionospheric piercepoints of integrated satellite observations for each reconstruction time interval are shown in panel c). Simulated total electron content map is given in panel d) and the corresponding map integrated from the reconstruction in panel e). Figures 3 and 4 in the manuscript are individual frames from this animation.

Movie S2.

TomoScand reconstruction of real ionospheric electron density and profile validations from 2018-11-09 07:00 to 24:00 UTC. Each frame is a reconstruction of a four-minute period. The time given in the figure indicates the end point of the time interval. The electron density cross section from longitude 23° is given in panel a) and the corresponding TEC map integrated from the reconstruction in panel b). In panels c), d), and e) the measured EISCAT ESR32 and UHF incoherent scatter radar and Juliusruh ionosonde profiles are given in red, the related reconstruction profiles with black and the prior distribution with cyan lines. Figures 6 and 7 in the manuscript are individual frames from this animation and profiles from panels c), d) and e) in the animation are combined in Figure 5.