Referee comment:

Although I am satisfied by the authors' response, I have one last suggestion regarding the following text: "The FACs are calculated based on Ampère's law close to the inner boundary of the magnetospheric domain. The details of the ionospheric boundary model are given in Ganse et al. (2025)". As currents that are calculated from curl of the magnetic field are perpendicular currents, this text sounds misleading. The two sentences could be reformulated as "The FACs are calculated as divergence of perpendicular currents that were obtained with the help of the Curlometer at the inner boundary of the magnetospheric domain, cf. formula (18) in Ganse et al. (2025)"

Author's response:

We agree that the description of the FAC calculation, and the connection to ionospheric currents could be made more clear and have revised the manuscript to clarify the point:

Original text, line 151:

The ionospheric boundary model is height-integrated, with all parameters integrated from ground level to an altitude of 200 km. The input parameters for the ionospheric model are FAC density $j_\parallel$, electron density ne and temperature Te . The FACs are calculated based on Ampère's law close to the inner boundary of the magnetospheric domain. The details of the ionospheric boundary model are given in Ganse et al. (2025).

In the new version, starting on line 151:

The ionospheric boundary model is height-integrated, with all parameters integrated from ground level to an altitude of 200 km. The input parameters for the ionospheric model are FAC density $j_\parallel$,electron density ne and temperature Te , which are determined close to the inner boundary of the magnetospheric domain. Ampère's law, in the form $j = \mathrm{curl}\, B/\mu_0$ (analogous to the Curlometer technique in space craft data), is used to determine the current density j. The divergence of the three dimensional current density j then yields FAC density $j_\parallel$, which is given as input to the ionospheric solver. In the ionospheric solver, the FAC density is used to determine ionospheric surface currents and electric potential (Eq. 18 in Ganse et al. (2025)). The details of the ionospheric boundary model are given in Ganse et al. (2025).