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Zoom meeting C ：11/4 PM2 (15:45-18:15)
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Quasistatic mesoscale field-aligned currents embedded in the diminished large-scale Region 1 current: Dawn-dusk asymmetry

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Irregular magnetic perturbations embedded in the diminished large-scale Region 1 current are prominent during prolonged northward IMF conditions. Our recent study for the duskside sector (Yokoyama et al., 2020) has shown that there occur relatively low-energy ion precipitation (down to a few hundred electron volts) and low-energy electron precipitation (lower than 200 eV) in the regions of the quasistatic mesoscale field-aligned currents that produce these irregular magnetic perturbations, and that the solar wind proton density is a controlling factor for the current density of the FAC. We have suggested an interpretation, which states that several pairs of FACs are generated in the duskside LLBL through a mechanism related to the solar wind plasma entry processes that can be more easily attained as the northward component of the IMF increases. A probable explanation is the phenomenon of reconnection inside the vortices of the Kelvin- Helmholtz (KH) waves. In this study we extend our previous research by examining the dawnside mesoscale FACs. By utilizing magnetic data obtained by SWARM satellites during the period from January 2017 to December 2020, we investigated the dependence of the dawnside FACs on the IMF, and solar wind plasma parameters. The results of the analysis show that the occurrence ratio of the mesoscale field-aligned current in the dawnside sector also has a strong dependence on the northward IMF condition. The results also show that there are weak dawn-dusk asymmetries in the occurrence ratio against the IMF B_Y; as for the dawnside sector, the occurrence ratio is higher for negative IMF B_Y than for positive IMF B_Y, while there is no clear tendency in the duskside sector. We also show that for our dawnside sector events the IMF with negative B_Y more often forms the Parker-Spiral orientation. This tendency agrees with the

one from an earlier study, i.e., the KH instability preference for the dawn flank during the Parker-Spiral orientation, which consolidates our interpretation.