

## **Supplementary Material Legend**

Table S1. Detailed descriptions about the permanent GPS stations.

Figure S1. The RMSEs using the random dataset for the period between 2015 and 2019.

Figure S2. The RMSEs using the dataset of KURU and ANMU stations for the period between 2015 and 2019.

Figure S3. The absolute errors of NN VTEC from GPS VTEC for the specific times of the day during 2020 over KURU station.

Figure S4. The absolute errors of NN VTEC from GPS VTEC for the specific times of the day during 2020 over ANMU station.

Figure S5. The relative errors of NN VTEC from GPS VTEC for the specific times of the day during 2020 over KURU stations.

Figure S6. The relative errors of NN VTEC from GPS VTEC for the specific times of the day during 2020 over ANMU station.