

Supporting Information for “Global Variations in the Time Delays Between Polar Ionospheric Heating and the Neutral Density Response”

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1. Figures S1 to S12

Introduction

This Supporting Information contains 12 additional figures that supplement the figures included in the main body of the paper. Figures S1–S3 show the densities measured on the CHAMP satellite during the geomagnetic storm that occurred on 20–21 November 2003, while Figures S4–S6 show the measurements taken on GRACE A during the same event. Figures S7–S9 show the densities measured on the CHAMP satellite during the

geomagnetic storm that occurred on 29–30 October 2003, and Figures S10–S12 show the measurements taken on GRACE A during this same event. In all graphs the density are graphed along the orbit path of the satellite, with this path superposed over contours of electric potentials from the W05 model, which used measured solar wind velocity and interplanetary magnetic field values for input. The blue circle marks the outer boundary, where potentials are zero. Minimum and maximum values of the electric potentials are indicated in the lower left and right corners of each map, with their locations indicated with the diamond and plus symbols, respectively. These data are graphed in corrected geomagnetic apex coordinates. The date and time labels over each map indicate when the satellite reached the highest latitude (or largest absolute value in the southern hemisphere), with the northern or southern hemisphere indicated next to the time. Ionospheric plasma in the ionosphere follows the contour lines, moving from noon to midnight at the center, and flowing in a sunward direction at lower latitudes. Figure S1 is the same as Figure 8 in the paper.

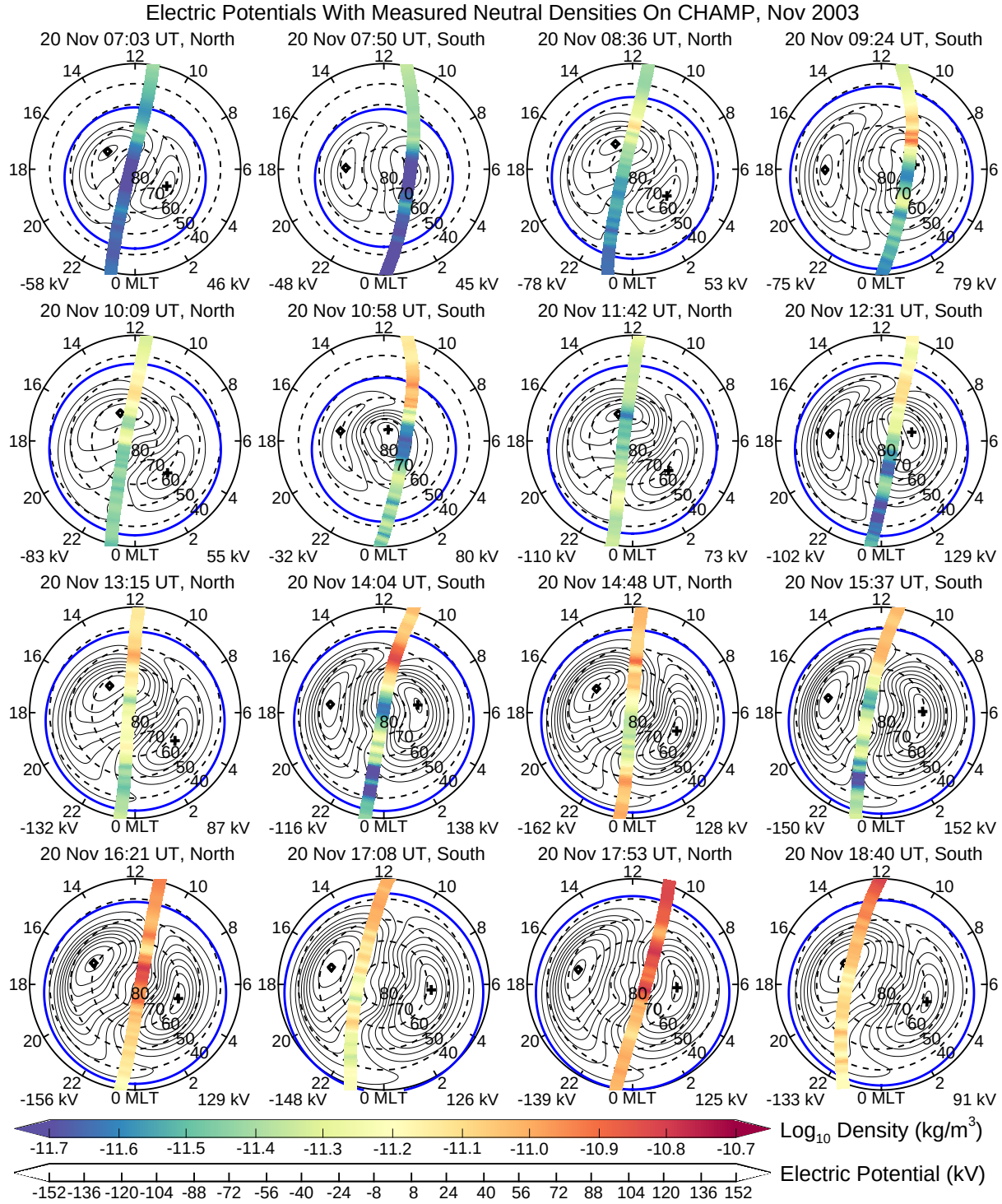


Figure S1. CHAMP density values superposed over electric potentials during the 20–21 November 2003 geomagnetic storm. Part 1 of 3.

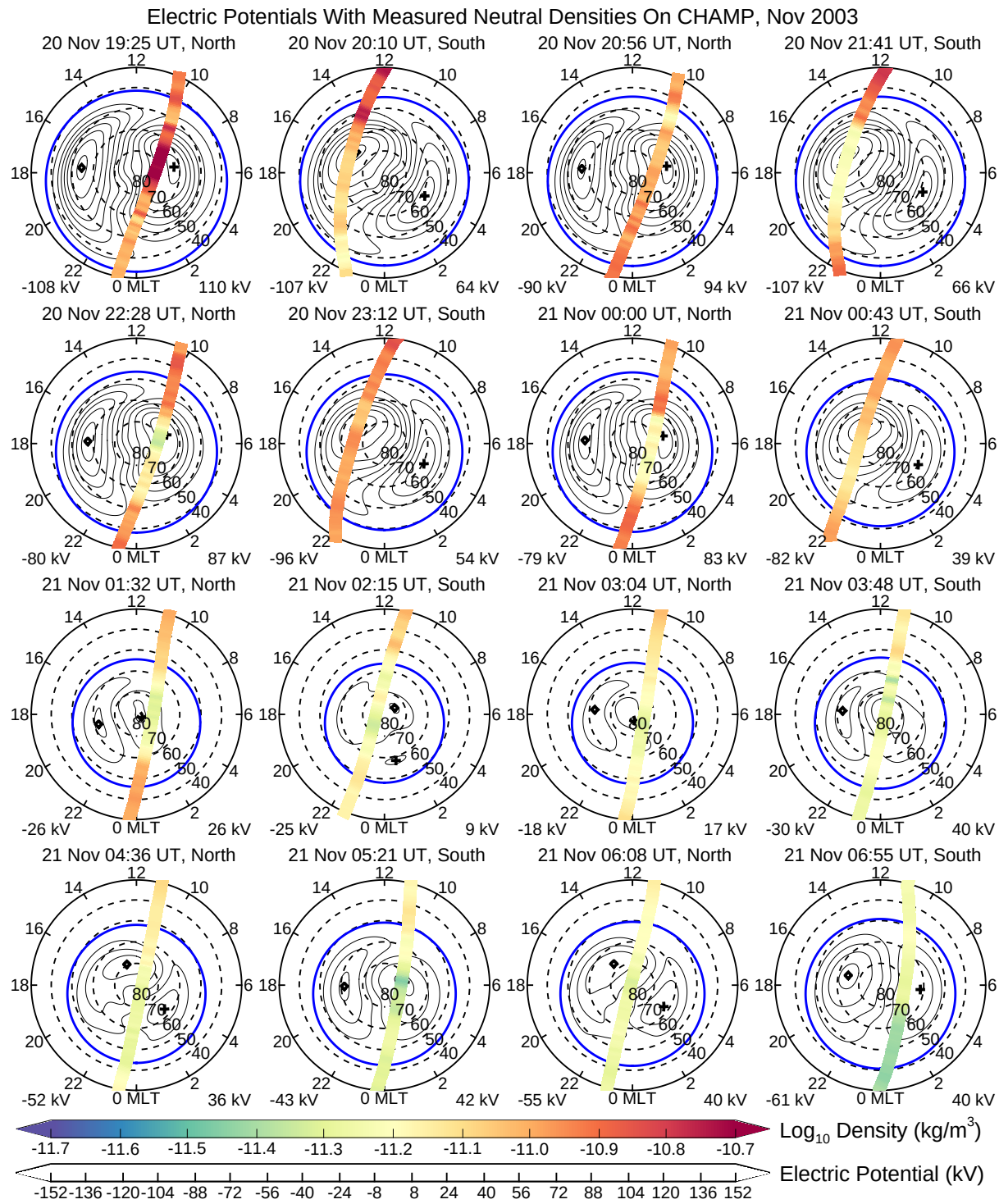


Figure S2. CHAMP density values superposed over electric potentials during the 20–21 November 2003 geomagnetic storm. Part 2 of 3.

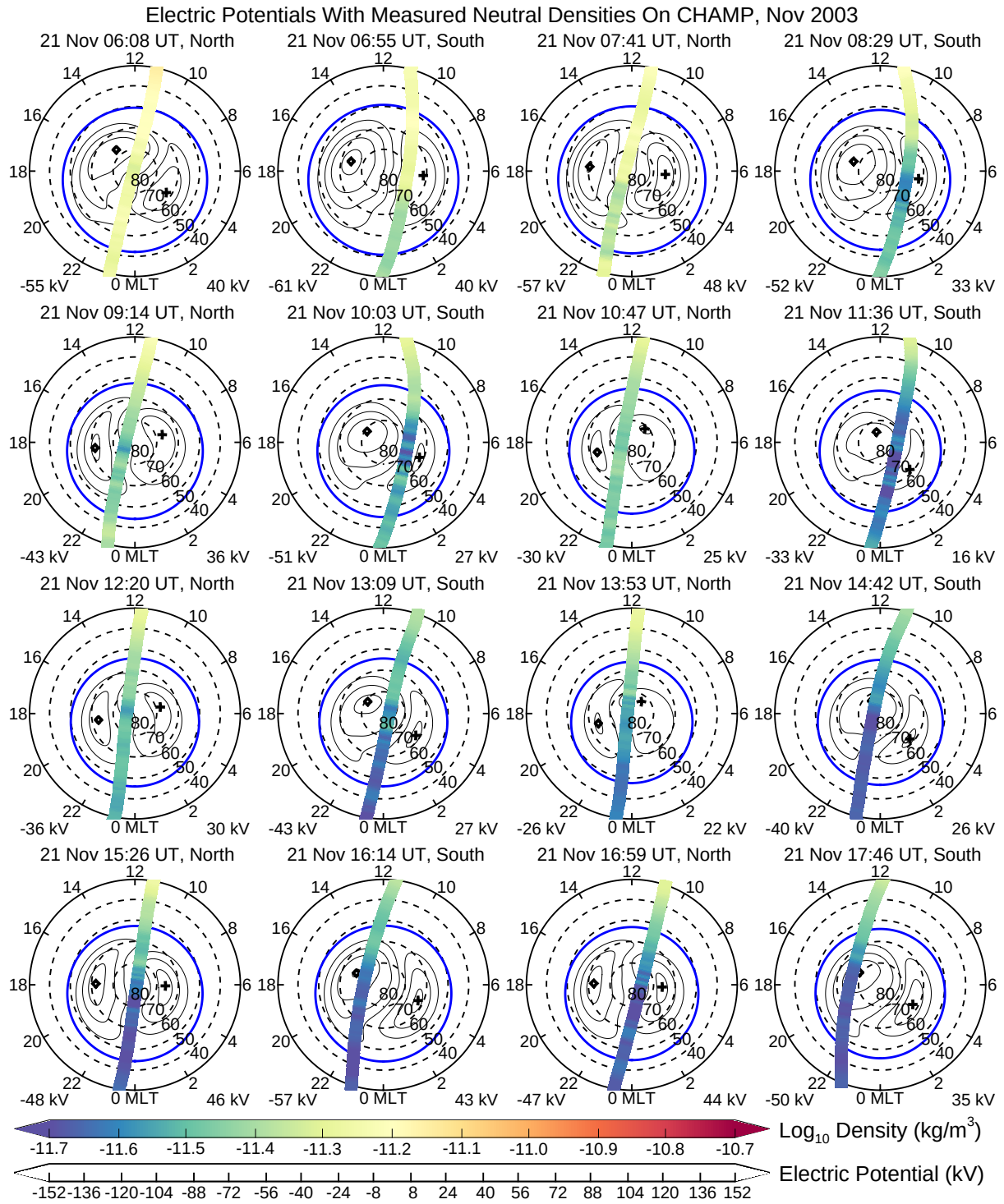


Figure S3. CHAMP density values superposed over electric potentials during the 20–21 November 2003 geomagnetic storm. Part 3 of 3.

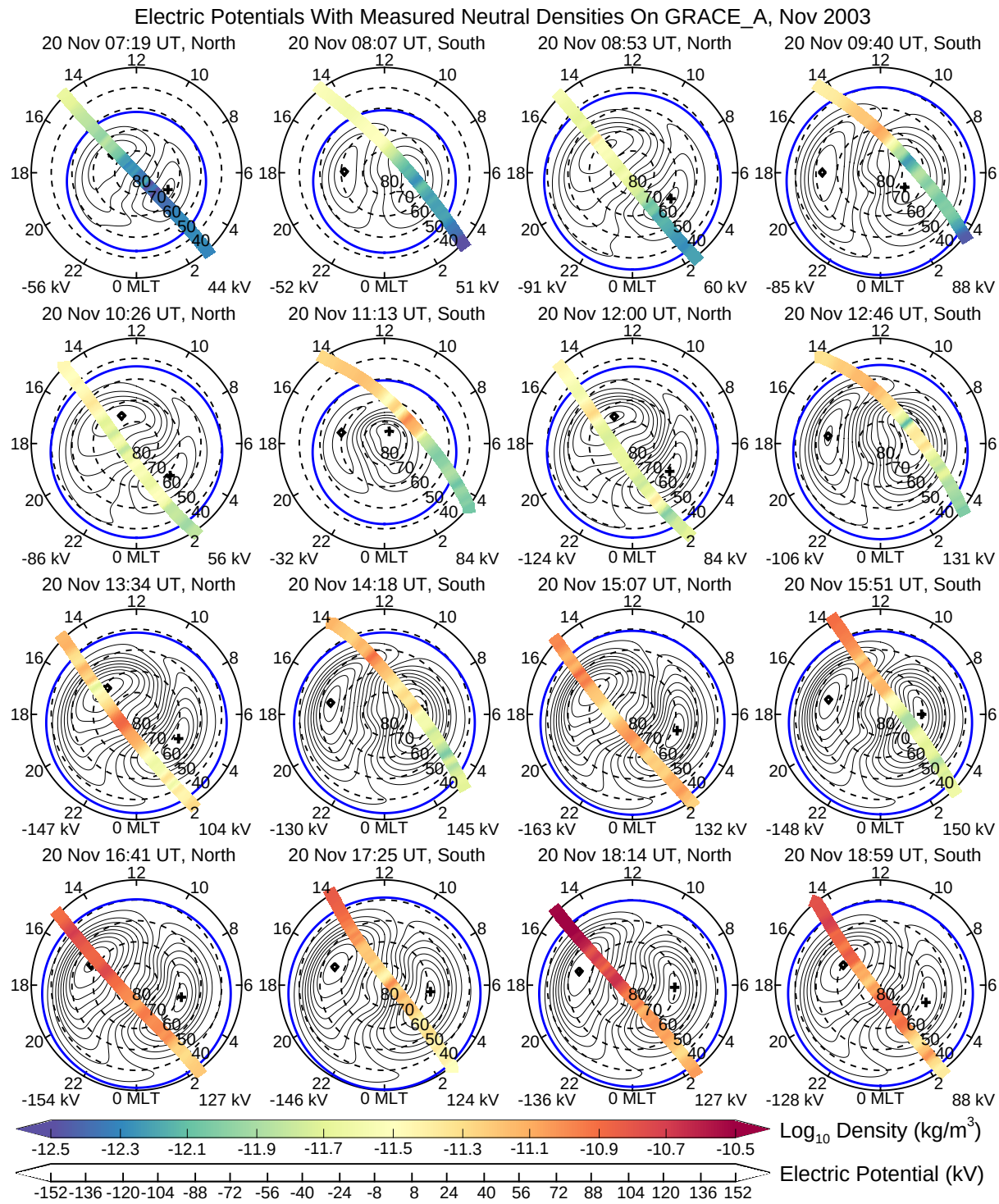


Figure S4. GRACE A density values superposed over electric potentials during the 20–21 November 2003 geomagnetic storm. Part 1 of 3.

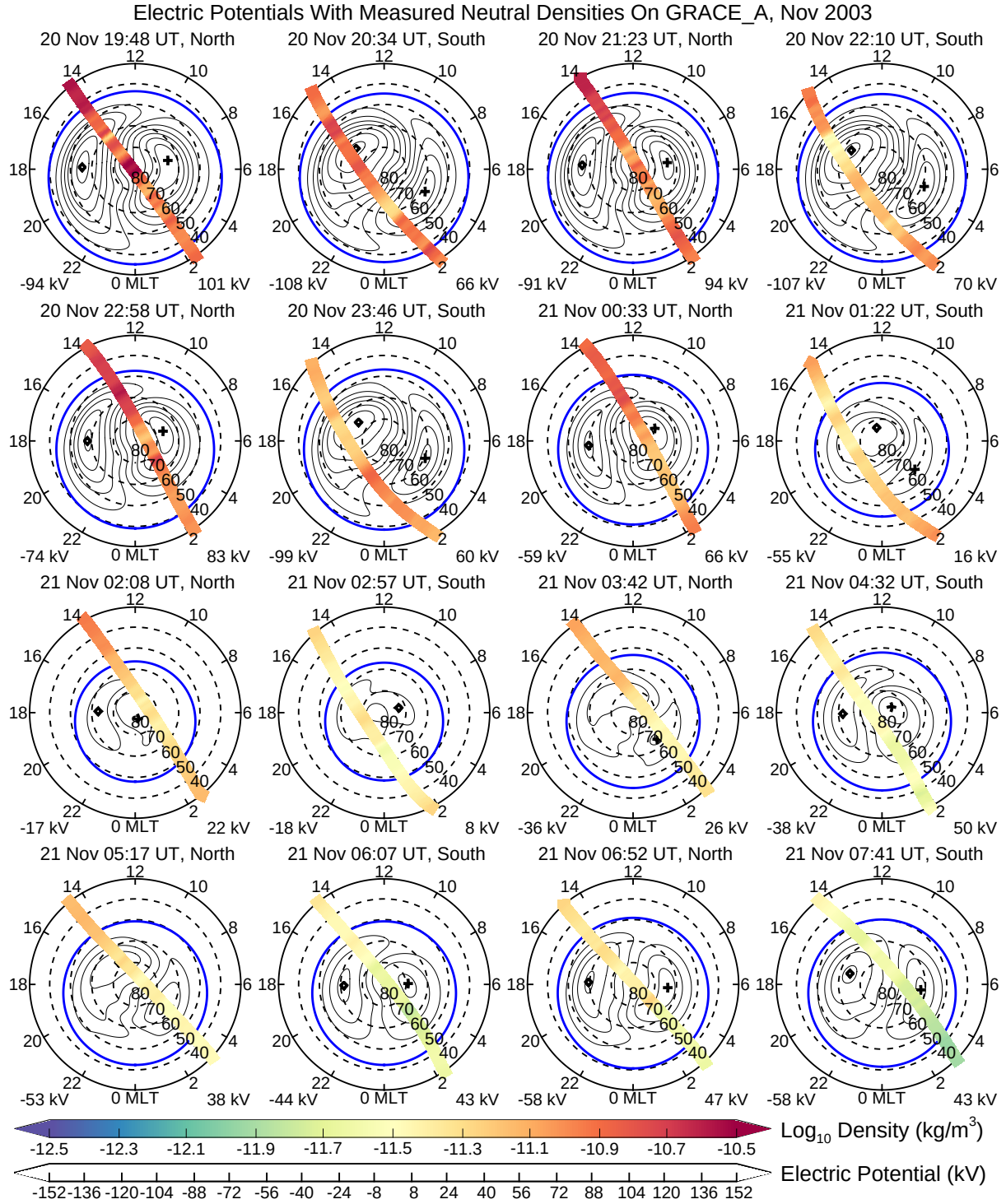
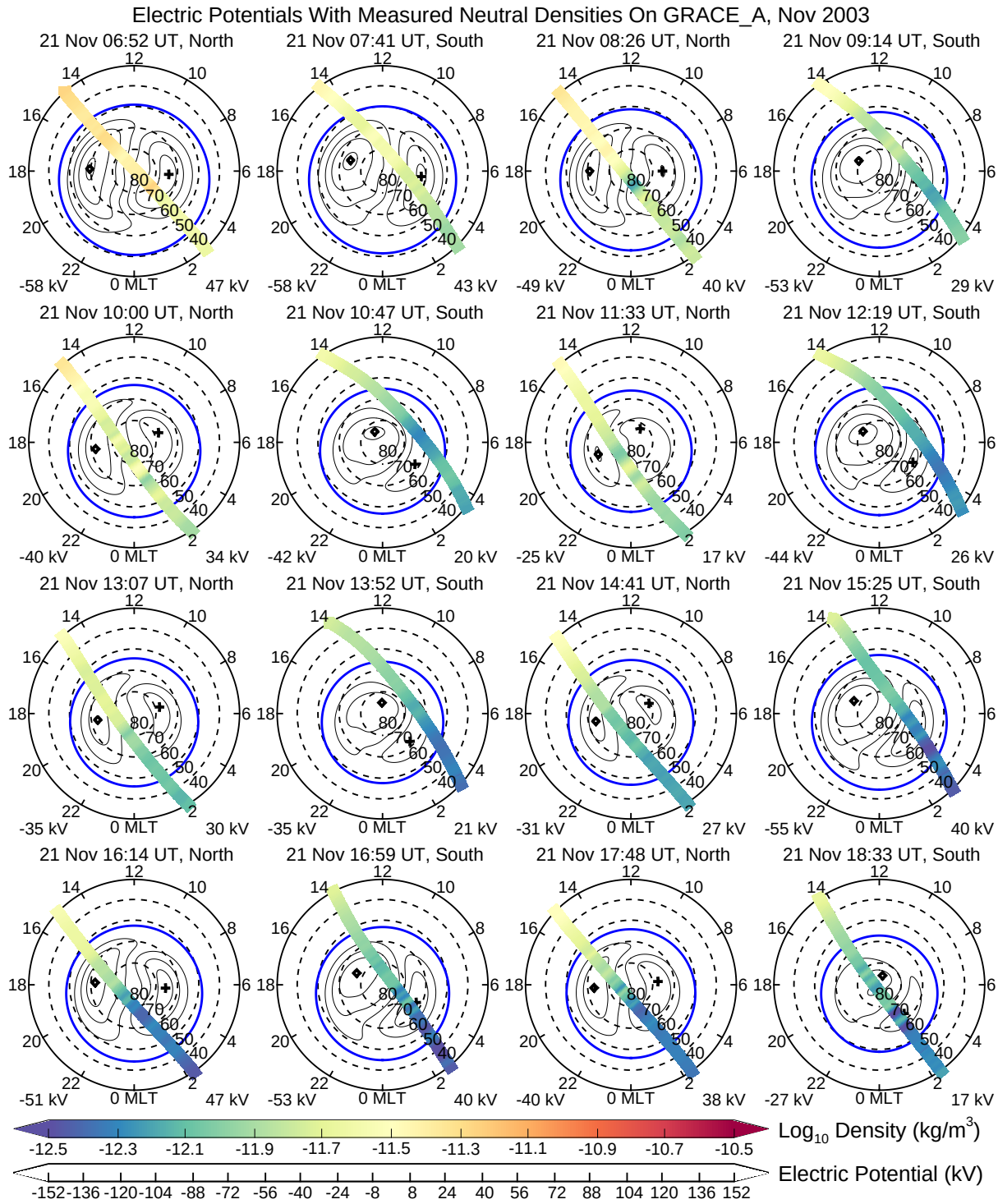


Figure S5. GRACE A density values superposed over electric potentials during the 20–21 November 2003 geomagnetic storm. Part 2 of 3.



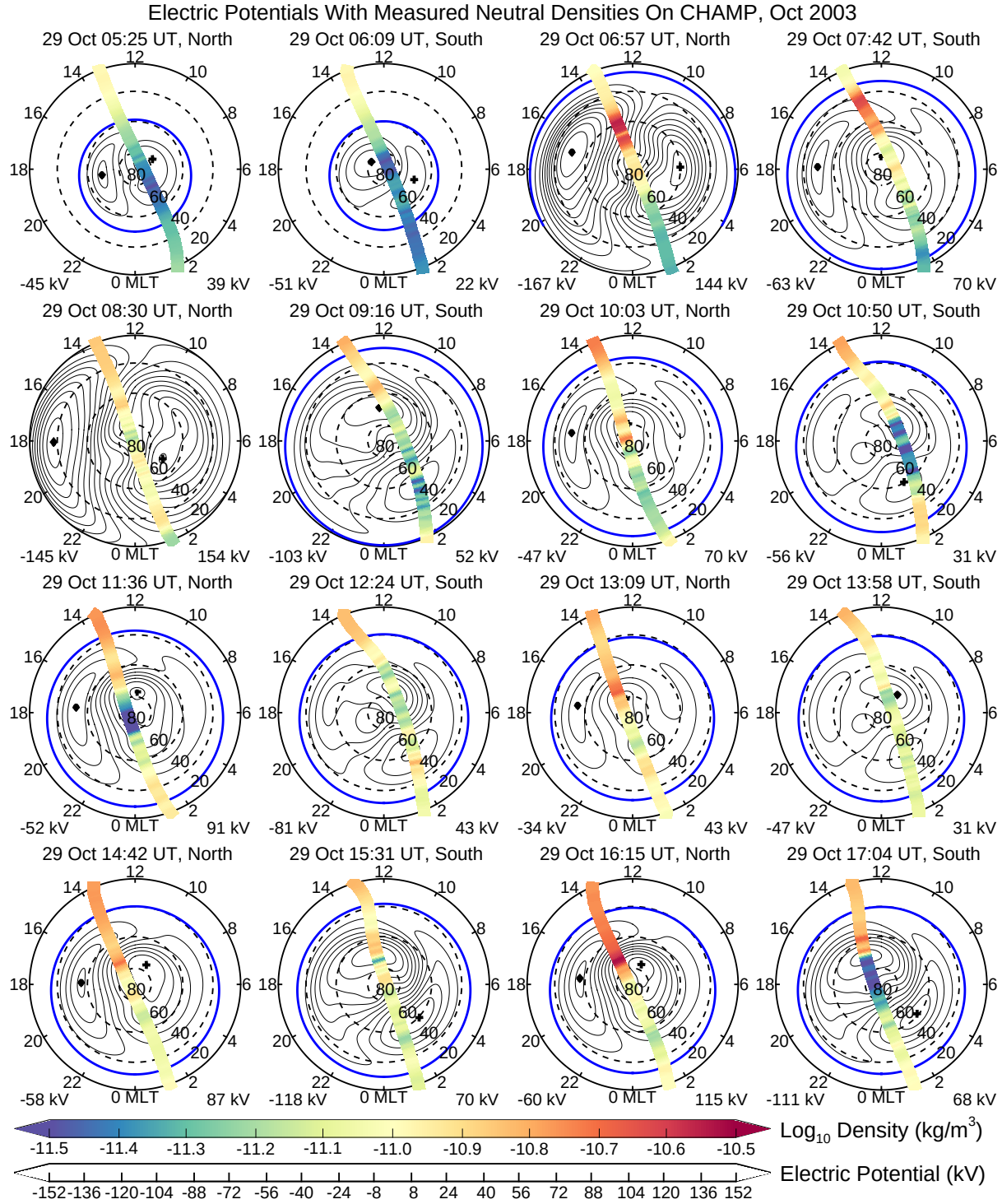


Figure S7. CHAMP density values superposed over electric potentials during the 29–30 October 2003 geomagnetic storm. Part 1 of 3.

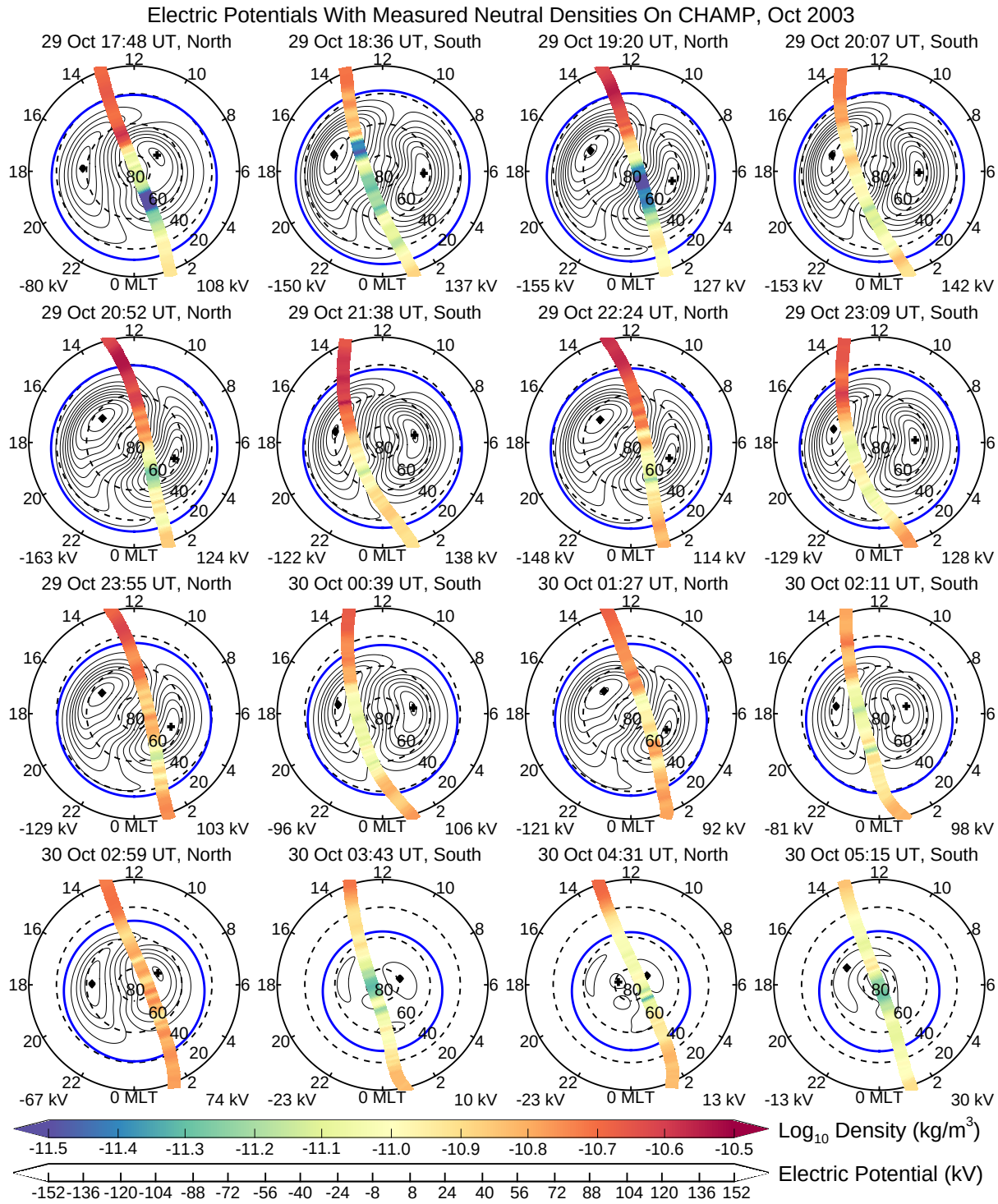


Figure S8. CHAMP density values superposed over electric potentials during the 29–30 October 2003 geomagnetic storm. Part 2 of 3.

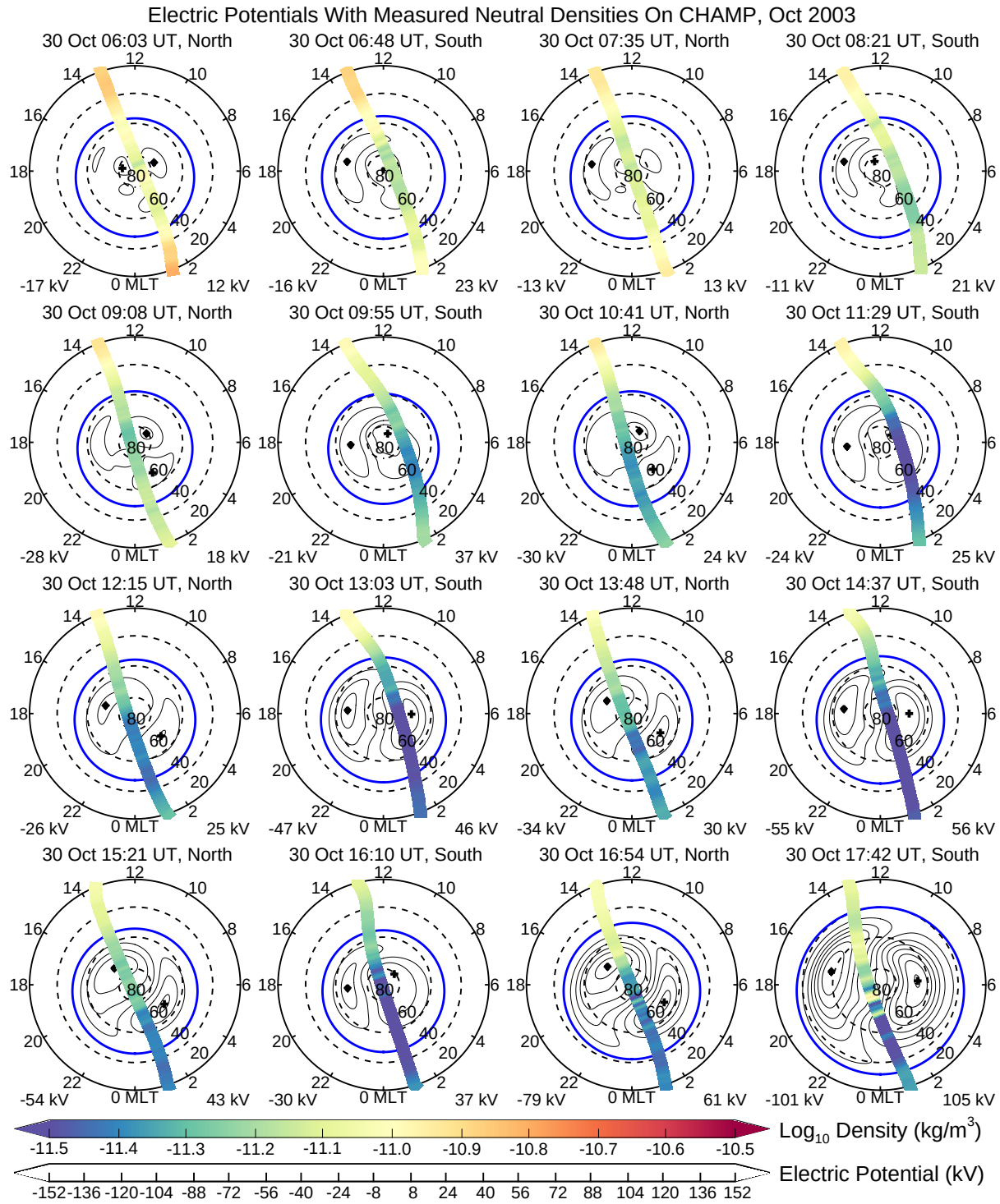


Figure S9. CHAMP density values superposed over electric potentials during the 29–30 October 2003 geomagnetic storm. Part 3 of 3.

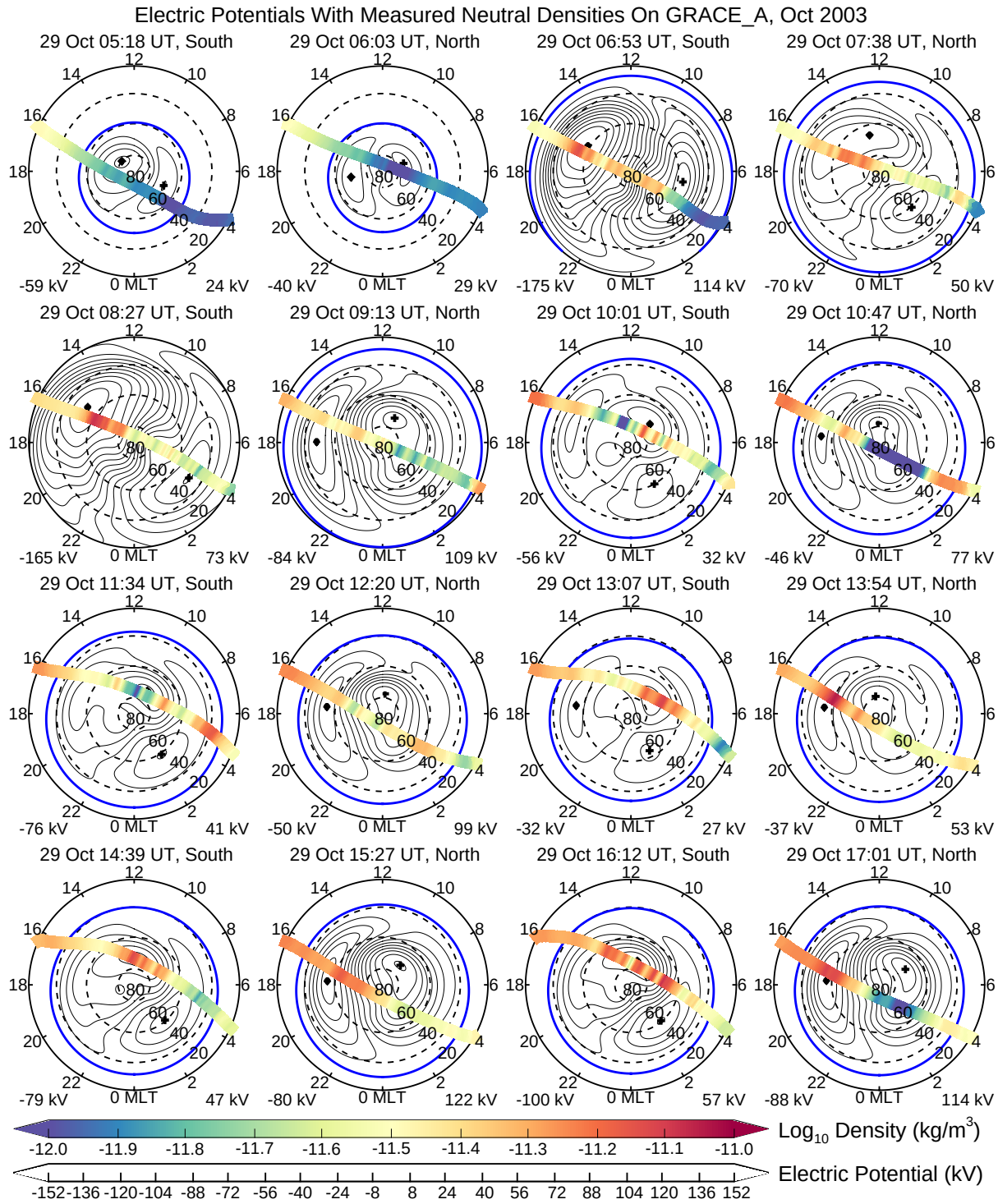


Figure S10. GRACE A density values superposed over electric potentials during the 29–30 October 2003 geomagnetic storm. Part 1 of 3.

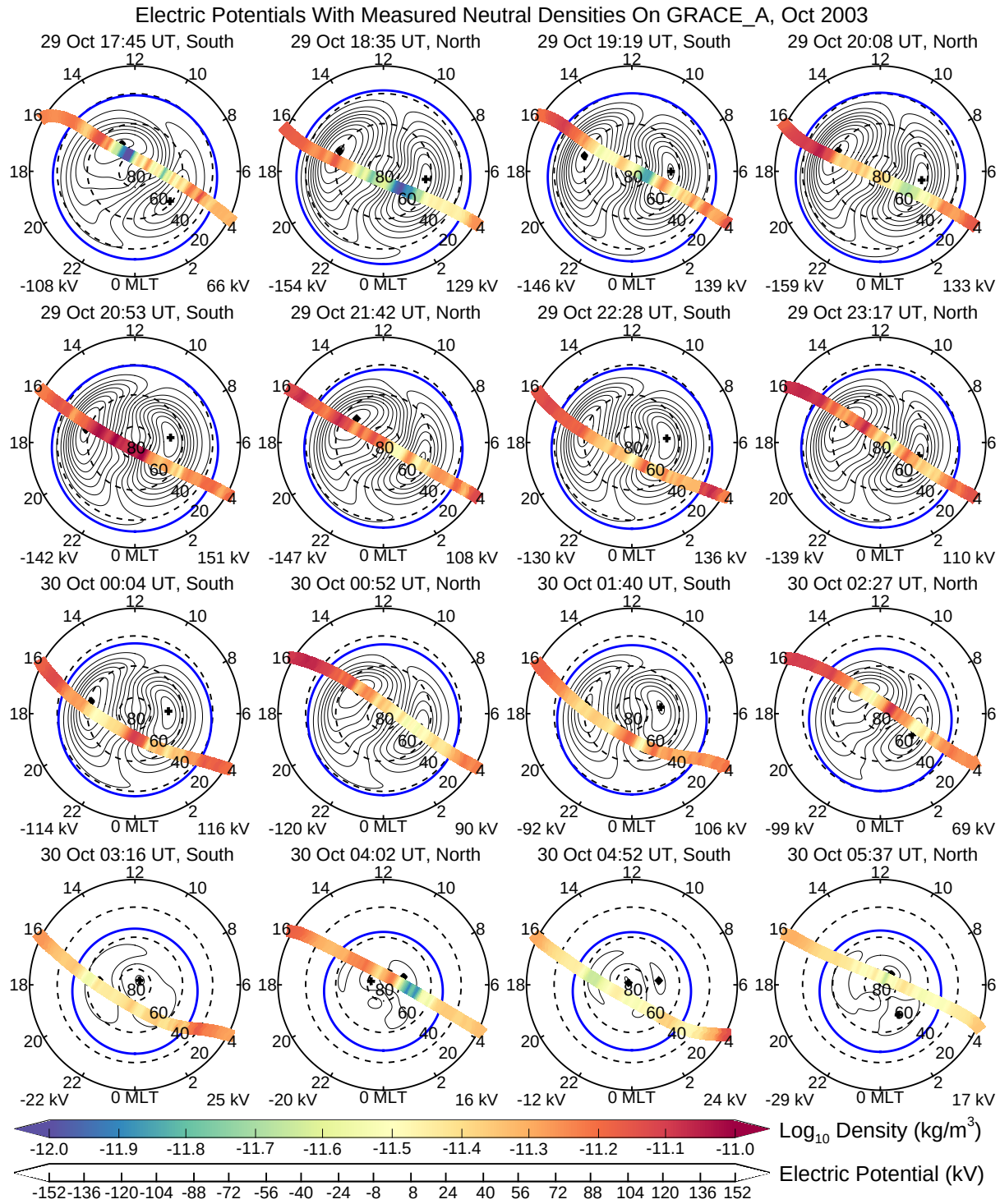


Figure S11. GRACE A density values superposed over electric potentials during the 29–30 October 2003 geomagnetic storm. Part 2 of 3.

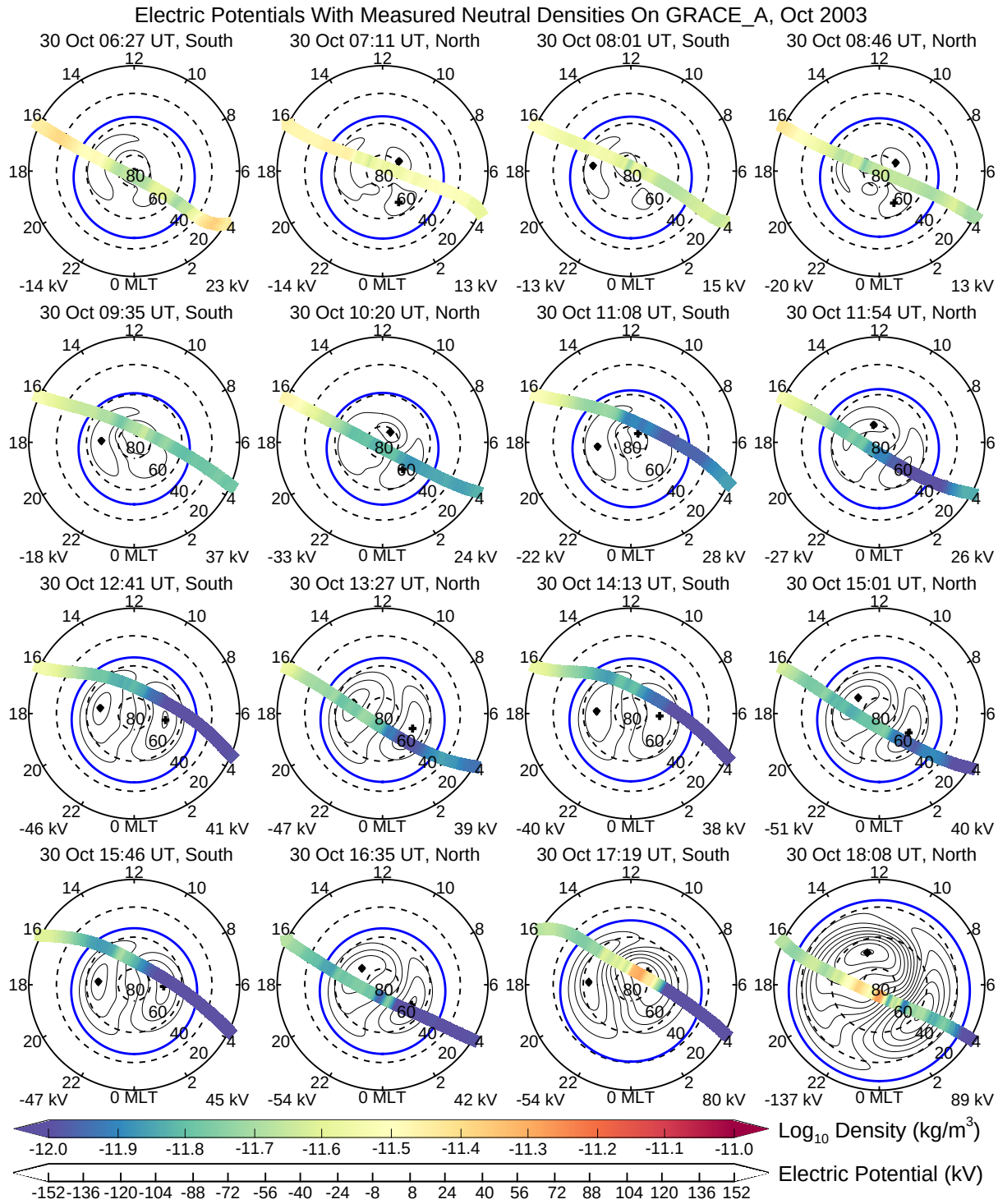


Figure S12. GRACE A density values superposed over electric potentials during the 29–30 October 2003 geomagnetic storm. Part 3 of 3.