

Field-aligned currents observed by Double Star TC-2 in polar region

J.K.Shi (1), Z.W.Cheng (1,2), J.G.Guo (1,2), T.L.Zhang (3), C.Chris (4), Z.X.Liu (1)

(1) Key Laboratory for Space Weather, CSSAR, Chinese Academy of Sciences, Beijing, China; (2) Graduate University of Chinese Academy of Sciences, Beijing, China; (3) Space Research Institute, Austrian Academy of Sciences, Graz, Austria; (4) Imperial College London, UK.

It is significant to study the Field-Aligned Currents (FACs) in the whole magnetosphere-ionosphere coupling system. Coordinating observation of the Double Star Program (DSP) and the Cluster mission provides us a very good opportunity for this study. In this paper, with the magnetic field measurements by FGM instrument on board the DSP TC-2 satellite, we study the FACs in TC-2's orbit that is in the middle altitude above the polar region. We establish a field-aligned coordinate system by using the Tsyganenko 96 model and identify the FACs by subtracting the model field from the measured field. We make a distinction between region 1 and region 2 FACs with the detrended data in the field-aligned coordinate system. Based on the selected FACs, the properties of the FACs in mid-altitude with that in low-altitude and high-altitude are compared. FACs above the southern polar region are also studied.