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EVALUATION OF INVERSION METHODS APPLIED TO IONOSPHERIC RO OBSERVATIONS

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Abstract. The new technique of radio-occultation can be used to study the Earth's ionosphere. The retrieval processes of ionospheric proling from radio occultation observations usually assume spherical symmetry of electron density distribution at the locality of occultation and use the Abel integral transform to invert the measured total electron content (TEC) values. This paper presents a set of ionospheric proles obtained from SAC-C satellite with the Abel inversion technique. The eects of the ionosphere on the GPS signal during occultation, such as bending and scintillation, are examined. Electron density proles are obtained using the Abel inversion technique. Ionospheric radio occultations are validated using vertical proles of electron concentration from inverted ionograms, obtained from ionosonde sounding in the vicinity of the occultation. Results indicate that the Abel transform works well in the mid-latitudes during the daytime, but is less accurate during the night-time.