

C/NOFS, Occultation Receiver for Ionospheric Sensing and Specification (CORISS)

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The C/NOFS Occultation Receiver for Ionospheric Sensing and Specification (CORISS) is a Global Positioning System (GPS) dual-frequency receiver. CORISS measures total electron content (TEC) along the line-of-sight between C/NOFS and GPS satellites, thus providing a remote sensing technique for vertical profile information during occultations (i.e., when GPS satellites are setting). Limb profiles of TEC can be inverted to produce vertical profiles of electron density. CORISS TEC measurements from occulting and non-occulting GPS satellites at various bearings relative to the satellite track constrain C/NOFS ionospheric models. It is also possible to measure L-band scintillations caused by electron density irregularities on lines-of-sight between C/NOFS and GPS satellites. This technique is currently in an early stage of development.

Please note that some data from the CORISS instrument may not be reduced and made available in a timely manner. These items are marked below with an asterisk (*)

Note also that Abel transform is used to derive the density profiles. Negative densities, which can result from gradient effects, should be ignored as an artifact of the inversion assumptions.

Measurement Output	Units	Estimated Accuracy	Frequency (Cadence)	Estimated Range of Output Values
Slant Path TEC (Total Electron Content in a unit column)	TEC units (10^{16} ions / cm^2)	0.01 relative 3 absolute	0.1 Hz - 1.0 Hz (times # of tracks)	0 - 1000
Electron Density Profiles (EDP)	cm^{-3}	Depends on ionospheric gradients (relative accuracy of neighboring points is $\sim 2\text{E}3$)	~ 22 / orbit (data collected at 1 Hz)	0 to $3\text{E}6$
On-Board Scintillation Indices & Spectra *	S4: dimensionless & σ -phi: radians	S4: 0.05 & TBD	0.1 Hz (times # of tracks)	S4: 0-1.5 & σ -phi: 0-1 spectral slope: 0 to -3
Stratospheric Temperature Profile *	deg K	1	~ 22 / orbit (data collected at 50 Hz)	0 - 300
High Rate Scintillation Products *	S4: dimensionless & σ -phi: radians	S4: 0.05 & other: TBD	50 Hz for occulting satellites (during CORISS Burst)	S4: 0-1.5 & σ -phi: 0-1 spectral slope: 0 to -3