

ARTIST-5 automatic scaling of quick-run DPS-4D ionograms

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Nowadays, the most common operational schedule at ionosonde observatories is to perform soundings at five minute intervals, or in some cases at fifteen minutes intervals. Such sounding intervals allow for sufficient integration time to produce high-quality ionograms. Using a state of the art DPS-4D ionosonde, a single sounding typically takes between one and three minutes. Once produced, the digital ionograms are immediately analysed and automatically interpreted by the ARTIST-5 software to determine the key ionospheric characteristics [1]. At the URSI GASS 2021, we presented an evaluation of the quality and reliability of these automatically scaled parameters [2], and the improvements achieved by ARTIST-5 in comparison to older versions of the software [3].

In some situations, a higher cadence of ionosonde soundings is required. The sounding cadence determines the temporal resolution at which the ionosphere can be studied, and some ionospheric processes are too fast to be detected using a five-minute sounding rate. In such cases, different sounding configurations are needed to produce quick-run ionograms. In some cases ionograms are produced every thirty seconds over some period of time (or example during a solar eclipse [4]). This requires some compromises to be made regarding the ionogram quality.

Here, we present an extension of the earlier evaluation of the ionogram autoscaling [3, 2] but this time focused entirely on the high-rate sounding. We evaluate the autoscaling quality for ionograms from various campaigns of quick-run ionograms that have been run during the past few years at the Dourbes observatory, using different possible ionosonde configurations.

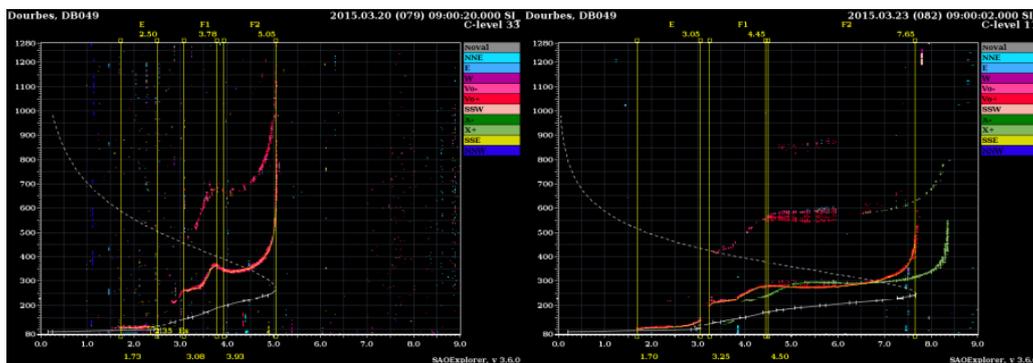


Figure 1. Quick-run (left) and normal (right) ionograms, taken at 9 UT on respectively March 20 and March 23 of 2015. Yellow markings show the automatically scaled characteristics. The performance of the autoscaler on the quick-run ionogram is comparable to that on the standard ionogram.

References

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