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Recent advances in near real time ionospheric determination by ionosonde data over Europe

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The increasing need for new and reliable communications services, especially those involving ionospheric HF communications, satellite communications and navigational systems, imposes demands for the continuous monitoring of the ionosphere and the development of an improved understanding of the propagation effects across a wide frequency spectrum. There is an on-going requirement to develop and improve means to monitor the ionospheric behaviour in real time, to minimise the disturbing effects over a wide range of propagation conditions and to mitigate the deleterious effects on radio systems. Modern ground-based ionosondes provide ionospheric vertical sounding observations in real time including the reconstruction of full 3-dimensional electron density profiles and the ionospheric drift data.

This paper reports on the development of a unified database of prompt ionospheric parameters across Europe providing near real time collection, distribution and archiving of ionosonde data. It outlines the main areas of research needed for the validation of the real time data in both undisturbed as well as ionospheric storm conditions and their ingestion and assimilation in ionospheric models. A review of the most recent activities pursued by the EU COST (Co-operation in the field of Scientific and Technical Research) ionospheric community relating to these issues is given.