Letter Topic: Closure of the UK Ionosondes at Chilton and Port Stanley

This letter is intended to alert our users and the scientific community to the decision of the UK's Particle Physics and Astronomy Research Council (PPARC) to withdraw all funding from the UK ionosondes program. Unless this decision is reversed, or alternative funding is found by the end of June, this will mean the closure of the ionospheric monitoring stations at Chilton in the UK and at Port Stanley in the Falkland Islands within the next 6 months.

The Chilton ionosonde continues the data series begun at Slough in 1931 and has just celebrated 75 years of regular soundings of the ionosphere, the longest sequence of ionospheric data anywhere in the world. The Port Stanley ionosonde has been taking data since 1945, making it one of the longest time series of ionospheric data anywhere in the southern hemisphere.

I hope that you will agree with us that PPARC's decision to close the Chilton and Port Stanley ionosondes, cutting off the valuable long-term data series and leaving crucial gaps in coverage at the North-Western edge of Europe and in the South Atlantic, is a sad loss to ionospheric, solar-terrestrial, upper atmosphere and radio science.

If you would like to voice your concern at this decision, please write or email to the contacts given below, asking that PPARC recognise the importance of these instruments and work with the UK ionosondes project team to urgently find alternative models and sources of funding for this important, interdisciplinary work. It is vital to avoid having to decommission the sites, if the data series are to stand any chance of continuation.

Also included below is a list of some of the most important benefits of the Chilton and Port Stanley ionosondes. Please feel free to choose from this list those points most important to your own area of interest and elaborate on them in your comments to PPARC.

Many thanks in advance for your support,

Sarah James

Head of Ionospheric Monitoring at RAL

Please send letters or emails to the following:

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And to:

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Please copy any letters or emails to:

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The Importance of the Chilton / Slough and Port Stanley Ionospheric Data

- The 75 year data series of regular ionospheric measurements from Slough and Chilton is the key international measure of long-term change in the upper atmosphere.
- The over 60 year data series from Port Stanley is one of longest sequences in the rest of the world, and along with Canberra, one of the two longest anywhere in the southern hemisphere. It is the key dataset in the South American sector of the world.
- The quality and consistency of the data has been very carefully maintained. For example; the cross-calibration carried out when the Digisonde at Slough was bought in the 1980's and when the instrument moved from Slough to Chilton in the 1990's. Manual scaling of the hourly parameters has continued in parallel with autoscaling, since that became available. This has enabled recent work analysing the accuracy of autoscaling over several years.
- The quality and length of the Slough / Chilton data series means it is widely used around the world as the leading ionosonde data series. These data are the single, most important sequence in global ionosonde data.
- The location of the Port Stanley ionosonde is unique. It is close to the South Atlantic Anomaly in the geomagnetic field, a region where energetic particles from the Van Allen belt are more likely to be deposited into the upper atmosphere. Unusual features which are seen in Stanley data may be related to its proximity to the South Atlantic Anomaly. It is the case that the ionosphere does not necessarily behave in the same way in the southern and northern hemispheres, due to the displacement of the geomagnetic dipole relative to the axis of rotation of the earth, and due to the effect of seasonal thermospheric winds on the composition of the upper atmosphere. These winds may themselves be subject to long-term change. So Stanley data is necessary to a global understanding of the ionosphere and upper atmosphere.
- Data from Chilton and Slough was recently used to demonstrate an electrical link between lightning and the ionosphere, a link long proposed but previously unproven. This is an excellent example of the long sequence of routine measurements taken by the UK ionosondes yielding answers in brand new areas of research, and adding to the understanding of the important subject of the vertical coupling of energy in the atmosphere. (Nature 435 (7043): 799-801 Jun 9 2005, Davis, CJ. and Johnson, CG.)
- Ionospheric data from Chilton has already been used in comparison with data from Mars, to understand the impact of solar activity on the Martian ionosphere. This topic is increasingly important for unmanned missions to other planets, and safety critical for proposed manned exploration of the solar system. (For example: Science 311 (5764): 1135-1138 Feb 24 2006, Mendillo, M. et al)
- The Chilton ionosonde has an important role in the European network of real-time ionospheric measurements, providing the north-western edge of real-time mapping of conditions across Europe. Its edge position makes its loss significant to the overall accuracy of the maps, especially when there are strong horizontal gradients in the ionosphere, for example at dawn and dusk. (STIF maps at http://ionosphere.rcru.rl.ac.uk/, Annals of Geophysics 48 (3) Jun 2005 - Special issue on Effects of the Ionosphere on Terrestrial and Earth-Space Communications).
- The UK has a strong reputation globally and within Europe in ionospheric science. European COST projects on trans-ionospheric radio propagation have not only used UK ionosonde data, but have also been led from the UK. This reputation and position will suffer from the termination of the most prestigious data in this area of science.
- Through the UK ionosondes, the UK contributes to the internationally important Space Environment Center (SEC) in the US, the Ionospheric Prediction Service (IPS) in Australia and to the World Data Centre (WDC) worldwide system. The data are vital to the production of the IF2 and IG indices, produced by the WDC for STP in the UK. Without Chilton and Port Stanley data, these indices can no longer be produced.
- One of the six science goals of the International Heliophysical Year (IHY) in 2007 is to "Determine the response of terrestrial and planetary magnetospheres and atmospheres to external drivers". Long-term ionosonde data is able to make a unique contribution to answering this question. IHY will be a period of unprecedented collaboration on this topic, internationally and across disciplines and with multiple instruments. It is a real shame to cut the UK ionosondes program just before such a vital period.

- As well as the areas of research that will be affected by the closure of Chilton and Stanley now, it should be noted that the importance of long-term studies of geophysical data are normally in areas that were not foreseen when monitoring work began. Referring to recent results from these stations in long-term change, the comparative studies of terrestrial and Martian ionospheres and into coupling between the troposphere and ionosphere through lightning, these studies could not have been done, or had not been imagined until recently. Unknown future science will be lost too with this funding decision.

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