

International Polar Year at the EISCAT Svalbard Radar

The EISCAT Svalbard Radar will operate essentially continuously during the first year of the International Polar Year interval, beginning 1 March 2007, and possibly beyond, depending on funding. The primary aim of the run is to provide a continuous data set which can be used for a variety of synoptic and statistical applications, as well as providing an unprecedented resource for the modelling community.

The IPY run will primarily comprise a dedicated series of field-aligned observations using the 42m antenna, augmented by a regular series of local area scan observations co-ordinated with other high-latitude incoherent scatter radars.

Observations will be completed as often as possible, but not less than once every 60 minutes, except during maintenance or exceptional special program operations. The observing code will provide measurements as profiles through the ionosphere, starting from the minimum practical altitude and extending to over 500km, and will include adequate plasma line calibration. The planned code scheme uses a 30x30 μ S alternating code providing adequate resolution over the full height range, and enhanced statistics in the E-region.

The Millstone Hill and Sondrestrom radars (and AMISR at Poker Flat?) are planning IPY runs every two weeks and the ESR should also run local, antenna-optimised, CP2-like scans during those intervals to provide electric field measurements. At other times, the 32m antenna will not be required for these observations; however, when not otherwise in use, the 32m antenna will be used for the collection of plasma line data and should therefore normally be parked at the field-aligned position.

The Sondrestrom radar will also run during scheduled ESR maintenance periods (and, with adequate co-ordination of the schedules, special programs which pre-empt the use of the 42m antenna)¹.

The data should be calibrated and analysed (for electron density, electron and ion temperature, and line of sight velocity) promptly² and made available through the Madrigal database. The data holdings in the Madrigal database should also be mapped through various Virtual Observatories³.

The ESR data will be treated as Common Programme but accounted separately.

Maintenance

As far as possible, maintenance should be scheduled well in advance and should be completed within a normal eight-hour shift. In such cases, coverage of the affected period should be requested at Sondrestrom.

¹ Regular scheduling consultations between Sondrestrom and EISCAT will be needed.

² Needs work to include the real-time data in Madrigal (but the mechanisms can be adapted from Millstone Hill).

³ Needs other interfaces in Madrigal: NetCDF?

Unplanned maintenance should be completed as rapidly as possible; the target should be to reduce all such interruptions to less than eight hours. In such cases, coverage of the affected period should be requested at Sondrestrom, but may be unavailable.

No gaps should exceed one week for any reason. A gap longer than two weeks would seriously erode the value of the extended dataset.

Special Programmes and SPEAR

Special Programmes can operate freely on the system within the normal budgetary and time allocation constraints, however, all programs should include the regular IPY, field-aligned (preferably 42m) observations at least at the minimum cadence. In such cases, and for Special Programmes which already incorporate such data, the minimum IPY observations will be treated as Common Programme, not charged to the Special Programme, and be available to all.

In exceptional circumstances, where the requirements of the particular Special Programme are incompatible with the IPY observations, exclusive use of the ESR may be granted to the Special Programme for up to 8 hours. In such cases, coverage of the affected period should be requested at Sondrestrom.

SPEAR

SPEAR and ESR operations will need to be carefully coordinated⁴. In general, SPEAR should avoid (high power?) heating during the actual IPY observations and for long enough before each such observation that the ionosphere can have reverted to its undisturbed state.

In exceptional circumstances, where the requirements of the particular SPEAR Programme are incompatible with the IPY observations, IPY observations may be suspended for up to 8 hours. In such cases, coverage of the affected period should be requested at Sondrestrom.

⁴ Needs SPEAR-active bit in ESR data headers; SPEAR logging information would be an advantage.