



RESOURCE

Radio Sciences Research on AntarCtic AtmosphEre

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We report the establishment of a Programme Planning Group for developing a SCAR (Scientific Committee on Antarctic Research) Scientific Research Programme (SRP) entitled “Radio Sciences Research on AntarCtic AtmosphEre” (RESOURCE). The proposed SRP aims to gather the communities that investigate the polar atmosphere, with particular reference to Antarctica but with a bi-polar perspective, by means of radio probes into a common shared initiative. The scope is to improve the current understanding of the Antarctic atmosphere by sharing the expertise and the experience achieved by several scientific teams in the world, thus facilitating the advancement in the field and avoiding any duplication of activities already in action. SCAR is the best platform to create the necessary environment to assess the actual current understanding and to address the efforts to fill the gaps. The radio techniques enabled by ground and satellite-based sensors have proved to be very effective when probing the lower, middle and upper atmosphere. In parallel, several scientific communities using radio techniques spent significant efforts to remove (what they consider) “atmospheric noise” to extract the desired information from their measurements (as in the case of geodesy). However, these communities do not sufficiently interact. The RESOURCE SRP aims to take advantage of the experience of the SCAR Expert Group GRAPE (GNSS Research and Application for Polar Environment). The proposed SCAR scientific programme RESOURCE will build upon this important legacy by enhancing interactions between the scientists who measure and utilise the entire radio spectrum, either as an auxiliary or principal observation, to study the atmosphere, the ionosphere, the ocean, the solid earth and outer space as well as ancillary measurements such as from magnetometers which provide supporting data on the solar-terrestrial relationship. Moving from the radio probing of the atmosphere, the proposed SRP aims to encompass the ICESTAR (past SCAR SRP) heritage to fill the current gap of SRPs dedicated to the study of the atmosphere, the upper atmosphere and the solar-terrestrial relationship. Additionally, RESOURCE is designed to support the SERSE SRP, as a continuation of the experience matured within the GRAPE EG, and the AAA EG to facilitate the interaction between researchers in the fields of Astronomy, Astrophysics, Atmosphere and Ionosphere. RESOURCE outcomes are relevant for global change studies, contributing to the investigation of the coupling between the neutral and ionized atmosphere and supporting a correct evaluation of the atmospheric impact on the measurements of geophysical parameters.

RESOURCE aspires to pursue three main scientific objectives:

1. To monitor the polar atmosphere;
2. To investigate the polar atmosphere;
3. To support the sciences interested in removing the atmospheric contribution from their observations or mitigating the negative impact of atmospheric contributions to their observations.