

**FROM COST271 EACOS (EFFECTS OF THE UPPER
ATMOSPHERE ON TERRESTRIAL AND EARTH-SPACE
COMMUNICATIONS) TO COST 296 MIERS (MITIGATION OF
IONOSPHERIC EFFECTS ON RADIO SYSTEMS) : TWO
EUROPEAN UNION PROJECTS ON IONOSPHERIC PHYSICS AND
RADIOPROPAGATION**

Zolesi Bruno, Ljiljana R. Cander

**Geomagnetism Aeronomy and Environmental Sciences, Istituto Nazionale di Geofisica e
Vulcanologia Via di Vigna Murata, 605, Rome, Italy**

Abstract :

The European ionospheric community has long been aware that co-operative research on an international basis is essential to deal with temporal and spatial changes in the ionosphere that can act to limit and degrade the performance of terrestrial and Earth-space radio systems. In particular, international co-operation is required for the collection of data, in real-time and retrospective modes, the development and verification of new methods to improve the performance of both operational and future terrestrial and Earth-space communications systems and the exchange of expertise on space plasma effects on Global Navigation Satellite Systems (GNSS). Therefore, EU COST (Co-operation in the field of Scientific and Technical Research) 271 Action on Effects of the Upper Atmosphere on Terrestrial and Earth-space Communications has had as main objectives: (1) to evaluate the influence of upper atmospheric conditions on terrestrial and Earth-space communications, (2) to develop methods and techniques to improve ionospheric models over Europe for telecommunication and navigation applications and (3) to transfer the results to the appropriate Radiocommunication Study Groups of the International Telecommunication Union (ITU-R) and other national and international organizations dealing with the modern communication systems. This paper summarises briefly the major achievements of this action. Having identified new challenges in the research area, a proposal has been prepared and here described for the follow-on COST271 Action in the COST Telecommunications, Information Science and Technology domain on Mitigation of Ionospheric Effects on Radio Systems (MIERS). The main objectives of the MIERS are: (a) to support and enhanced the existing European facilities for historical and real-time digital ionospheric data collection and exchange needed for methods and algorithms to mitigate the effects of ionospheric perturbations and variations on

advanced terrestrial and space based communication services by creating an effective computing infrastructure; (b) to develop an integrated approach to the ionospheric modelling, create the mechanism needed to ingest processed data into models, extend and develop suitable mitigation models and define the protocols needed to link models together; and (c) to strength the areas of expertise that already exist by stimulating closer cooperation between scientists and users, focusing the scope of all the previous COST ionospheric related studies to the mitigation of ionospheric effects on specific radio systems which are in direct operational use or in their developing stage as the new systems.