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PREFACE

Repeat station measurements are designed specifically to represent and model the geomagnetic field and its secular variations on a regional scale with a level of detail that would not be achievable using only data from permanent geomagnetic observatories. Although geomagnetic repeat station surveys have a long tradition in many European countries, they were carried out independently in the individual countries. For this reason, it has been difficult for a long time to use the data efficiently for studies of geomagnetic secular variations of the whole European continent.

Attempting to solve this problem at a European level, a working group was set up in 2003 at the first Workshop on European Geomagnetic Repeat Stations, which was organized by the GeoForschungsZentrum (GFZ, Germany) at the Niemegek observatory. In the same year, this initiative was also acknowledged by the International Association of Geomagnetism and Aeronomy (IAGA) and it is supported by IAGA Resolution #4, Division V. Later on, the working group was named MagNetE (Magnetic Network of Europe). The group aims to coordinate the national efforts to produce more homogeneous, high-quality geomagnetic vector data over the European continent. Three consecutive workshops were held in 2005, 2007 and 2009, in Warsaw, Bucharest and Helsinki, respectively, to ensure ongoing cooperation between the participants of more than 20 countries. Due to this common effort, it is now possible to use the repeat station data to study the main field, the secular variation, and to some extent, the lithospheric field at a continental scale in Europe.

The stimulus that led to the conception of this special issue was the 5th MagNetE Workshop that was held in Rome, Italy, in May 2011, where more than 40 scientists from 20 countries presented the results of recent field surveys and discussed plans and strategies for future data acquisition and geomagnetic modelling efforts.

The 12 papers published in this special issue represent only a subset of the scientific results presented at the 2011 symposium. These 12 contributions provide specific information on the numerous magnetic repeat station measurements that have been performed in Europe, and on the possible solutions to improve the quality of the repeat data. This special issue also shows one of the main results of the MagNetE working group: the European Declination Chart 2006. It is based on 382 magnetic repeat station measurements that were performed over the period of 2005-2007, and on the annual mean values of 42 observatories that are operated in 21 European countries.

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