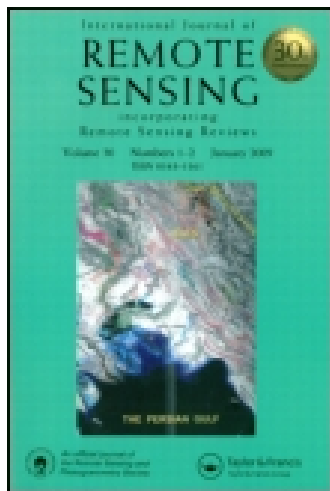


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GUEST EDITORS' PREFACE

Remote sensing of atmospheric radiation and dynamics

The term *remote sensing* can be traced back to the times of Aristotle (e.g. Aristotle's *camera obscura*) despite the traditional assumption that this term was coined by Evelyn Pruitt only just 60 years ago (Rees and Rees 2012). Of course, the revolution on the subject took place during the nineteenth century with the invention of photography, the development of electromagnetic theory, and the extension of our knowledge of electromagnetic radiation to include the infrared, ultraviolet, and radio wavelength ranges.

There is no doubt that in the last few decades a number of atmospheric characteristics and phenomena have been investigated in depth due to the rapid growth in both satellite-borne and ground-based instrumentation (e.g. Varotsos 2002). However, interpretation of the associated data requires the conversion of remotely sensed observations to information about the atmosphere through application of a detailed understanding of atmospheric radiative transfer. The latter presupposes a good knowledge of solar and terrestrial radiation, as well as the radiative energy budget in the Earth-atmosphere system (Cracknell and Varotsos 2007a, 2007b, 2011; Kondratyev and Varotsos 1995, 2002).

This special issue is linked to the biennial International Symposium 'Atmospheric Radiation and Dynamics' (ISARD-2013), which was held at Saint Petersburg – Petrodvorets, Russia (<http://onlinereg.ru/site.php?go=195&page=3966&lang=ENG>), during 24–27 June 2013. Most of the articles in this special issue have their origins in articles presented at that conference; however, they have been revised and extended and are not just conference reprints.

The objective of this special issue is to collect outstanding articles on recent advances in all disciplines of atmospheric radiation and dynamics exploiting remote-sensing techniques and instrumentation. In general, the articles that are featured in this special issue refer to the following issues.

- Remotely sensed atmospheric species (Borovski et al. 2014; Cracknell and Varotsos 2014; Dorokhov et al. 2014; Gavrilov et al. 2014; Makarova et al. 2014; Matvienko et al. 2014; Virolainen et al. 2014).
- Aerosol optical-microphysical properties (Gorchakov et al. 2014; Kozlov et al. 2014; Tomshin and Solovylev 2014; Yegorov et al. 2014).
- Sounding precipitation with satellite and ground-based radars (Khlopov and Veselovska 2014; Startseva et al. 2014).
- Cloud parameters estimated from optical remote sensing (Fomin and Falaleeva 2014; Gatebe, Kuznetsov, and Melnikova 2014).
- Radiative transfer (Bass, Nikolaeva, and Kuznetsov 2014; Larsson 2014).
- Remotely sensed air temperature (Chernigovskaya et al. 2014; Loginov, Ippolitov, and Kharyutkina 2014; Polyakov, Timofeyev, and Virolainen 2014).
- Modelling algorithms for remote-sensing applications (Devyatkin et al. 2014; Kozoderov et al. 2014; Titov et al. 2014).

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