Geophysical Research Abstracts
Vol. 19, EGU2017-14786, 2017
EGU General Assembly 2017

Estimating atmospheric temperature profile by an airborne microwave radiometer

Jun Zhang (1,3), Jian Xu (1), Mareike Kenntner (2), Franz Schreier (1), and Adrian Doicu (1)

(1) Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Methodik der Fernerkundung (IMF), Oberpfaffenhofen, Germany, (2) Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Physik der Atmosphäre (IPA), Oberpfaffenhofen, Germany, (3) Technische Universität München (TUM), Munich, Germany

As the rising atmospheric issues such as climate change, air pollution, and ozone depletion have extracted extensive attraction worldwide, observing and modeling of atmospheric quantities becomes critical to our understanding of the environment. This work focuses on the performance of an airborne passive microwave radiometer called MTP (Microwave Temperature Profiler). We aim to obtain vertically distributed atmospheric temperature from intensities measured by the instrument in terms of three frequencies and ten viewing angles. A retrieval program TIRAMISU (Temperature InveRsion Algorithm for MIcrowave SoUnding) has been utilized for processing the MTP data. To solve this severely ill-posed inverse problem, an analysis of different ways of constructing the penalty term onto the Tikhonov-type objective function is conducted. This numerical analysis can help us to better understand pros and cons of these regularization methods and to investigate the measurement capabilities of MTP.