

## Preface

The 2011  $M_w$  9.0 off the Pacific coast of Tohoku Earthquake, the greatest earthquake in the modern history of Japan and the fourth largest earthquake of the world in the era of instrumental seismology, occurred along the plate interface east of northeastern Japan. Slip area of this great earthquake extends about 500 km long and about 200 km wide with the average slip of about 10–20 m, rupturing about two thirds of the megathrust zone east of the entire northeastern Japan arc. Northeastern Japan was severely damaged by this earthquake; especially the huge tsunami generated by it caused tremendous loss of life near the Pacific coast of northeastern Japan, about 20,000 people missing and dead.

Considering unprecedented impacts, both social and scientific, not only limited in Japan but over the world, EPS had planned two different special issues associated with this 2011 Tohoku Earthquake. The first one is a special issue with rapid publication of results obtained immediately after the event, in which only letter-type manuscripts were accepted. This first special issue, namely “First Results of the 2011 Off the Pacific Coast of Tohoku Earthquake”, was published in No. 7 of Vol. 63, 2011, with 70 letter-type papers. The present special issue is for the second one more focused on longer-term scientific developments about the 2011 Tohoku Earthquake than the first special issue.

We are aware of that we couldn't extend the deadline long enough to provide sufficient time for the longer-term scientific developments to be fully made. However, thanks to the great efforts by the authors, we received more than 30 submissions. Among them, 25 papers are accepted and contained in this issue. In this special issue, diverse research topics regarding the 2011 Tohoku Earthquake are covered, such as rupture process, rupture simulations, hypocenter distribution, seismic velocity structure, stress field, seismic magnitude differentials, variability of megathrust earthquakes, induced earthquakes such as outer-rise or inland events, earthquake triggering, rheology of the crust, tsunami inundation, site response change, soil liquefaction, vibration of a tall building, and ionospheric disturbances. We believe these papers contribute significantly for deeper understanding of generation mechanism of great interplate earthquakes such as the 2011 Tohoku Earthquake and of many related phenomena.

The editors greatly acknowledge the authors and reviewers for their time and efforts in publishing this special issue of *Earth, Planets and Space*.

Finally, we would like to give our deep condolences to all the victims of the Tohoku Earthquake.

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