

Preface to the Vol.15, No. 21, 2022, “Sun and Geosphere”
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A Special Issue entitled, “Solar influences on the Magnetosphere, Ionosphere, and Atmosphere” was initiated in the Fall of 2022. A total of seven manuscripts were submitted despite the short notice. Two of the manuscripts were rejected and five are published in this issue.

Two papers deal with Sun-to-Earth propagation of coronal mass ejections using numerical simulations. Baratashvili et al. consider the solar wind and CME propagation tool called *Icarus*, which solves the partial differential equations of ideal MHD. These authors show that by appropriately combining different resolution grids, numerical methods, and slope limiters, it is possible to simulate CMEs more accurately. Brchnelova et al. (2022) investigate of some of the sources of physical and numerical errors affecting coronal extrapolations in the COCONUT model (it is a fast-converging MHD model for solar corona simulations). Solar influence on Earth atmosphere received a lot of attention after the Starlink event of 2022 February 3 involving a moderate geomagnetic storm caused by a moderate-energy. Gopalswamy et al. (2022) reported that the CME underlying the storm ended up as a magnetic cloud (MC) in the solar wind. The MC had a southward component that was enhanced by a high speed solar wind compressing the backside of the MC. Ogunjo and Rabiou (2022) report that on a global scale in solar cycle 23, Earth’s surface air temperature has a high correlation with F10.7 flux and a weak correlation with the sunspot number. Furthermore, they find that the solar activity – surface air temperature correlation is negative in the southern hemisphere and positive in the northern hemisphere. While this hemispheric delineation pattern is prevalent during the start of the solar cycle, an inverse hemispheric delineation is found during the declining phase of the cycle. Finally, Bezrukovs (2022) is an instrumentation paper describing the solar microwave imaging facility at the Ventspils International Radio Astronomy Centre (VIRAC), Latvia. An archive of microwave emission maps of the active and quiet Sun have been established and it is accessible to the science community.

All manuscripts were reviewed by international referees, who contributed to the improvement in the quality of the papers. *Sun and Geosphere* thanks the following reviewers for their time and effort in evaluating these manuscripts: Ali Kilcik, Camilla Scolini, Nat Gopalswamy, Masumi Shimojo, Talwinder Singh, Babatunde Rabiou, Nimalan Swarnalingam, and Endawoke Yizengaw. Thanks are also due to Atila Özgüç, the Editor-in-Chief for his cooperation in bringing this issue.

References

Baratashvili, T., Verbeke, C., Keppens, R., and Poedts, S.:2002, Sun and Geosphere 15 (2), 49.

Bezrukovs, D.: 2022, Sun and Geosphere 15 (2), 55.

Brchnelova, M., Kuźma, B., Zhang, F., Perri, B., Lani, A., and Poedts, S.: 2002, Sun and Geosphere 15 (2), 59.

Gopalswamy, N., Xie, H., Yashiro, S., and Akiyama, S.:2022, Sun and Geosphere 15 (2), 65.

Ogunjo, S. T. and Rabiou, A. B.:2022, Sun and Geosphere 15 (2), 75.