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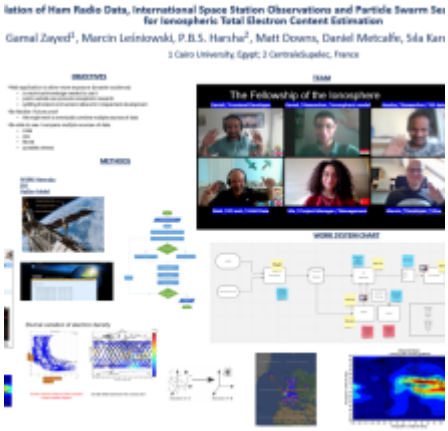
Poster
Evaluation of Global Ionospheric TEC Using Simultaneous Observations from Amateur Radio Networks, International Space Station, and NeQuickG Model for Space Weather Prediction, Ionospheric electron density plays a significant role in long-distance communications and sky-wave propagation. Prediction of the accurate state of the ionosphere is necessary to understand the accurate signal perturbations thereby estimating the critical parameters for better signal transmission. The space weather impacts on such trans-ionospheric technological systems are evident. In this work, a web application is developed to represent the global day-to-day electron density variations from the NeQuickG model. Also, the ground-based HAM radio broadcast network hop data with different wavelengths (eg. 10 m and 20 m) and simultaneous top-side electron density with space-based International Space Station (ISS) probe data from floating point measurement units are examined. The electron density variations for the year 2017 are clearly represented. Optimization techniques are necessary to frame a denser spatial grid-based ionospheric electron density map from all the observations. It is essential to estimate the optimal weight function that can distribute the observation influence over empty grid bins with minimum error variance through a probabilistic approach. User-understandable metrics development exclusively for Amateur radio operators and civil aviation sectors is focused. In the near future, the developed web-based application could serve as a better visualization platform for space weather forecasting.
This project, Fellowship of the Ionosphere, is a Global Finalist in the 2022 NASA Space Apps Challenge. NASA Space Apps 2022 had 31,400+ registered participants from 162 counties and territories, with over 3000 submissions from 5327 teams. Global Finalists are ranked as one of the top 35 projects from all submissions.},



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