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Poster
An overwhelming number of space weather effects take place in or are driven by the thermosphere and ionosphere. Society’s increasing dependence on space for defense and commercial needs requires a new, comprehensive examination of the ionosphere-thermosphere (IT) region, in order to improve our fundamental understanding of these space weather processes. The Geospace Dynamics Constellation (GDC) mission will provide the first comprehensive look at IT. GDC will track multiscale measurements of energy input from the magnetosphere to the ionosphere-thermosphere, its effects in the IT region, and internal processes throughout the IT system. GDC's six satellites will characterize the IT system and its geomagnetic drivers from ~375 km altitude. This mission will make unprecedented multi-point orbital measurements of ionosphere/thermosphere density, composition, and temperature, magnetic and electric fields, and ionospheric variability. The measurements and science advancements will inform our understanding of the processes that change atmospheric densities, cause ionospheric scintillation, and drive ionospheric currents, with effects on satellite drag, navigation/communication, and geomagnetically induced currents.

GDC's contribution to our understanding will enable improvements in nowcasting and forecasting of IT variability and its effects. Further, GDC will transmit low-latency space weather-relevant data that will be available for our operational partners, allowing GDC to demonstrate a near real-time data pipeline to evaluate and prioritize the highest-impact measurement parameters and spatio-temporal scales. GDC’s comprehensive, multipoint picture of IT variability and its drivers will establish the understanding of fundamental space weather processes and the operational pipeline that we need for our increasing reliance on space.

Poster category:

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Ionosphere and Thermosphere Research and Applications
Meeting homepage
Space Weather Workshop 2025
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