



Global-scale Observations of the Limb and Disk (GOLD): Results from Early Observations

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The Global-scale Observations of the Limb and Disk (GOLD) is a NASA mission of opportunity that images the Earth's thermosphere and ionosphere from geostationary orbit. GOLD investigates how the thermosphere-ionosphere (T-I) system responds to geomagnetic storms, solar radiation, and upward propagating tides and how the structure of the equatorial ionosphere influences the formation and evolution of equatorial plasma density irregularities. The GOLD instrument measures airglow emissions from atomic oxygen (135.6 nm) and molecular nitrogen Lyman-Birge-Hopfield (LBH) bands (137 to 162 nm), which are used to make global-scale images of temperature and composition during the day. On the limb, GOLD derives exospheric temperatures from LBH emission profiles, and measures molecular oxygen density using stellar occultations. At night, global-scale images of peak electron density are derived from 135.6 nm emission. GOLD was launched from French Guiana on January 25, 2018 aboard SES-14, a communications satellite now positioned on the equator at 47.5° west longitude. Nominal instrument operations began in October. This presentation gives an overview of GOLD's early observations, which include daytime maps of composition and temperature and nighttime images of oxygen emission from the equatorial anomaly which display routine occurrences of plasma density irregularities (bubbles).