The Next Generation Geostationary Operational Environmental Satellite: GOES-R the United States Advanced Weather Sentinel

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The Geostationary Operational Environmental Satellite-R (GOES-R) is a follow on to the existing GOES system currently operating over the Western Hemisphere. The system is planned to be launched in April 2015 and be ready to replace the existing system in 2017. The GOES system is the United States weather sentinel for forecasting hurricanes, severe, storms, and flash floods. The concept of operations is for two satellites to operate at one time over 75 degrees west and 135 degrees west with one on orbit spare. This allows for monitoring over the entire Western hemisphere and adjacent oceans, and provides quick redundant capability in case of failure. The system is primarily used as input into numerical forecast models, forecast and warnings. The system also aids in providing information about air quality, sea surface temperature, space weather, and winds. The GOES-R is the next generation US weather satellite funded by NOAA, but jointly managed between NOAA and NASA. NASA acquires the spacecraft and instruments for NOAA, while NOAA will lead the development, deployment, and operations of the ground system. The GOES-R will provide advanced capabilities by providing five times more spectral information, temporal coverage six times faster than the current system, and 50% higher spatial resolution. GOES-R is a transition from 1980's technology to state of the art technology. The heart of the GOES-R system is the Advanced Baseline Imager (ABI), a sixteen channel imager with six visible channels and 10 infrared channels in the 3.9 to 13.3 um spectrum. The instruments scan six times faster giving full hemispheric disk every 5 minutes while still affording continental United States coverage and mesoscale looks with higher temporal resolution within that timeframe. The ABI will produce advanced more accurate products such as cloud, snow, and ice parameters, sea surface temperature, air quality products, winds, and land information. The Geostationary Lighting Mapper will be the first geostationary sensor to detect and monitor in cloud, cloud to cloud, and cloud to ground lighting strikes, which increases existing ground based measurements extensively over land and especially ocean. This will aid in forecasting severe storms and tornado activity. There are also several space environment sensors that will be discussed that will increase out ability to monitor and predict solar flare to help with communications, navigation, and power blackouts forecasts, and improve our ability for energetic particle forecasts to help with polar aviation routing and astronaut safety. Finally, the GOES-R system will still provide search and rescue, a data collections system (DCS), and other direct readout capabilities. This presentation will focus on the performance aspects of this system, the status of the flight and ground progress, the attributes and status of the development sensors, and summary of the ground architecture for getting the data to the users.