S41-02

FY-3E EM satellite performance and application on orbit at first year

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After about one year on-orbit commissing, FY-3E will be transitioned to the operational mode. Three are brand-new instruments, including the wind radar (WindRAD), solar spectral irradiance monitor (SSIM), and solar X-ray and ultraviolet imagers (X-EUVI). Seven are improved instruments, including medium resolution spectral imager-low light (MERSI-LL), microwave temperature sounder-III (MWTS-III), high spectral infrared atmospheric sounder-II (HIRAS-II), GNSS radio occultation sounder-II (GNOS-II), solar irradiance monitor-II (SIM-II), space environment monitor-II (SEM-II), triple-angle ionospheric photometer (Tri-IPM). The inherited microwave humidity sounder-II (MWHS-II) also comes with better specifications. Performance of all instruments met the required specification and generate the expected retrieval products although they faced with the challenge of some new complicated straylight and thermal environment fluctuation on this special orbit. FY-3E will work together with FY-3C in AM orbit and FY-3D in PM orbit to constitute the constellation of polar-orbiting satellites in three orbital planes roughly 60 degrees apart. Together with other international polar-orbit satellite systems, FY-3E, FY-3C and FY-3D will provide full global coverage every 6 hours; it is expected that data assimilated will be coming from 18 instruments, up from the current 11, for the CMA NWP model (CMA-GFS). A more uniform temporal spacing of observations will show a particularly large impact in situations where the forecast error is rapidly increasing, such as rapidly evolving weather situations. It will support the denser sampling of the diurnal cycle which is critical for climate monitoring, such as surface temperature, atmospheric temperature and humidity, as well as precipitation. The successful launch of FY-3E enables the satellite community to meet the baseline configuration agreed by CGMS members in supporting the "WMO Vision for the GOS in 2040".