Solar power profile prediction for low earth orbit satellites

ABSTRACT

This paper presents the development of algorithms using MATLAB® codes to predict the in-orbit satellite power profile. Satellite power requirement is a crucial parameter for its in-orbit operation. In this case, it is best to identify the power profile which indicates the amount of power generated over a time frame of an orbit. However, the determination of the satellite power profile requires substantial amount of efforts to compute and this is largely due to the complex numerical treatments. Orbital parameters are deemed to affect the determination of the satellite power profile. Therefore, a computer program has been written to solve all the governing equations leading to the satellite power profile prediction for an orbit and eventually for a year. The power profile validation was done analytically using the governing equations before the profile is generated through the computer codes. This work contributes greatly towards the small satellite (<100 kg) power sizing effort and eliminates the need of a costly commercial power sizing software.