A Selection of Electrical Machine as an Electromechanical Battery for Earth Orbit Satellite

Abstract

Many type of electrical machine can be used as an electromechanical battery for low earth orbit satellite. Electromechanical battery is motor generator mode coupling with flywheel which used to store kinetic energy in motor mode during sunlight and supply electrical power from the stored kinetic energy by generator mode during eclipse. Permanent magnet synchronous machine has proved to be a good candidate for its performance which achieves a requirement of electromechanical battery. More than one configuration among Permanent magnet synchronous machine have been presented to choose between them for satellite battery. the choice depend on which one has a better performance. Also paper presents aspect of the design solution of permanent magnet synchronous machine (PMSM) and selections of material such as carbon AS4C for flywheel which will achieve the required high energy storage with minimum flywheel diameter and weight compared with other designs we describe the formatting guidelines for IJCA Journal Submission.

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- Buried permanent magnet machine and Halbach array machine