

Poster Session (P)

Poster Lunch (1)

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RESEARCH ON THE CELESTIAL SPHERE STELLAR IDENTIFICATION METHOD BASED ON DATA COMPRESSION

Abstract

At present, it is the most accurate method to obtain the attitude information of the spacecraft by using the stellar as the observation datum, and the key of this method is to identify the stellar. The stellar identification is to find a guide stellar corresponding to the observed stellar in the guide stellar catalog. In this paper, the construction of the guide stellar feature database and the stellar identification methods are studied and a new celestial sphere stellar identification method is proposed by using data compression. Firstly, many suitable stars are screened to construct the standard guide catalogue according to the ability of the stellar detection limit. And the lossless compression of guide stellar feature database is constructed according to the standard guide catalogue and detector field angle. Secondly, the observation triangle of angular distance of identification stars is constructed by using the position information of detector and the number of stars. And the stellar number and angular distance are extracted and constructed state matrix from the compression guide stellar feature database; Thirdly, by comparing the angular distance of observation triangle with the angular distance of guide stellar feature database, the identification of state matrix is marked. And the angular distance of guide stellar feature database corresponding to the identification of state matrix is extracted and is compared with the angular distance of observation triangle to identify the stellar. The field of detector is 100100, the detection limit is 6.5 magnitude star, and there are 9040 guide stars in the guide stellar catalog. The storage space of guide stellar feature database is changed from 8MB before compression to 1.91MB compressed. The results show that this method can reduce the storage space of guide stellar feature database by using data compression, and also it can reduce search time and space complexity by using the state matrix.