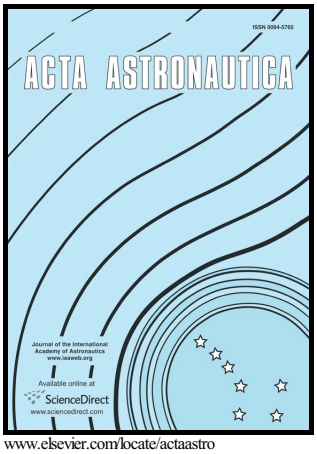

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Abstract:

[1] The "Type-27 AIS message" is the long-range AIS broadcast message, which is primarily intended for the long-range detection of AIS typically by satellite. The TT3-AIS uses a four-frequency receiver scheme which includes two frequency channels conventionally applied by the AIS system and two new frequency channels allocated to the long-range AIS broadcast message. To the end of April 2016, the TT3-AIS has already received more than 11,400 packets of Type-27 AIS messages. In this paper, a detailed analysis of the Type-27 AIS messages is performed. Firstly, an eavesdropper diagram of the space-borne AIS received from the worldwide vessels is obtained. Secondly, the analysis to the trend of the number and the ratio of the new-type vessels is performed based on the Type-27 AIS message. The detection probability of the new-type vessels is also discussed. The result would be helpful on the usage of the long-range AIS message both for data application and for the improvement in designing the next space-based AIS receiver.

Keywords: TianTuo-3; Space-based AIS; Type-27 AIS message; Space AIS Channels; Detection Probability

1. Introduction

[2] Satellite monitoring on the vessels equipped with the Automatic Identification System (AIS) is of vital importance to navigation, vessel tracking, searching and rescuing missions [e.g., 1-7]. The space-based AIS can increase the coverage range tremendously relative to the conventional land-based AIS, the range of