

## Accepted Manuscript

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PII: S0273-1177(15)00410-X

DOI: <http://dx.doi.org/10.1016/j.asr.2015.06.006>

Reference: JASR 12296

To appear in: *Advances in Space Research*

Received Date: 10 February 2015

Revised Date: 6 June 2015

Accepted Date: 8 June 2015

Please cite this article as: Lee, S.I., Yeom, K-W., A New Technique to Improve Pointing Performance for Ship-borne Mobile Telemetry Antenna System, *Advances in Space Research* (2015), doi: <http://dx.doi.org/10.1016/j.asr.2015.06.006>

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## A New Technique to Improve Pointing Performance for Ship-borne Mobile Telemetry Antenna System

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### Abstract

A new technique to improve the tracking performance of a ship-borne mobile telemetry antenna system in the marine environment is presented for Korea Space Launch Vehicle-I (KSLV-I) mission. The concept of 'pointing bias' is introduced to compensate for the instability or inaccuracy of a sensor in the ship-borne mobile telemetry antenna system. The LEO satellites in the form of 'tracking campaign' are used to measure the pointing bias. The proposed technique is verified through the tests in Jeju sea and Pacific sea in the period of November 23 ~ 28, 2012. The results demonstrated that the azimuth pointing bias about  $-0.27^\circ$  and  $-0.49^\circ$  appears in Jeju sea and Pacific sea, respectively and the pointing bias was proved to be mainly relevant to the heading measurement error of the gyrocompass. Taking into consideration of the pointing bias results in Jeju sea and Pacific sea, the gyrocompass was corrected by  $0.25^\circ$  to compensate for the heading measurement error on the ship-borne mobile telemetry antenna system. The correction value of  $0.25^\circ$  is selected to reduce the risk in tracking. Due to insufficient correction, the residual pointing bias about  $-0.12^\circ$  in Pacific sea was observed and the successful tracking of KSLV-I is achieved on January 30, 2013.

Key words: Launcher, KSLV-I, Ship-borne Mobile Telemetry Antenna, Pointing Accuracy, Pointing Bias, Gyrocompass Correction

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