Transmission of Augmentation Corrections Using the Japanese Quasi–Zenith Satellite System for Real–Time Precise Point Positioning in Australia

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Key words: GNSS/GPS; Positioning; Precise Point Positioning; Ambiguity Resolution, QZSS

SUMMARY
A collaborative research project between the Australian Cooperative Research Centre for Spatial Information (CRCSI) and the Japanese Aerospace Exploration Agency (JAXA) aims to assess the feasibility of using the Japanese Quasi-Zenith Satellite System (QZSS), in particular the L-band Experimental (LEX) signal to deliver precise positioning solutions in Australia. This paper presents the results of a study to transmit precise correction messages such as satellite orbits, clocks and biases through the LEX signal to enable real-time Precise Point Positioning with Ambiguity Resolution (PPP-AR). Real-time precise correction messages based on available real-time correction products made available by the IGS were transmitted from Australia to the QZS master control station in Japan for broadcasted on the LEX signal. The correction messages were received and decoded in Australia and used to calculate real-time PPP-AR solutions. The time differences between the message time of frame and the time of arrival to the rover receiver were compared. A comparison was also made between messages transmitted on the LEX signal with a land-based communication network. The real-time PPP solutions obtained from the developed "Australian LEX" system have comparable performance to those obtained through a land-based network, demonstrating that latency and reliability of the system is adequate to support real-time PPP applications.

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FIG Working Week 2015
From the Wisdom of the Ages to the Challenges of the Modern World
Sofia, Bulgaria, 17-21 May 2015