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Author: Ms. Brelveenraj Kaur Rajwant Singh  
Universiti Sains Malaysia, Malaysia, brelveen@gmail.com

Dr. Aiffah Mohd Ali  
Universiti Sains Malaysia, Malaysia, aiffah@usm.my

Prof. Mardina Abdullah  
Universiti Kebangsaan Malaysia (UKM), Malaysia, mardina@ukm.edu.my

Dr. Siti Aminah Bahari  
Universiti Kebangsaan Malaysia (UKM), Malaysia, sitiaminahbahari@ukm.edu.my

Dr. Talini Pinto Jayawardena  
Spirent Communications, United Kingdom, talinipj@gmail.com

## IONOSPHERIC EFFECTS ON GBAS IN MALAYSIA

**Abstract**

This paper presents the effects of amplitude scintillation on 3 GPS receivers installed at the Kuala Lumpur International Airport (KLIA) for a period of 12 months, from September 2017 until September 2018. Space-based technologies such as the Global Navigation Satellite System (GNSS) plays a major role in aviation navigation due to the high demand for long-haul air travel. This has encouraged airports to implement augmentation systems, which has led to lesser delays and fewer disruption to travelers. The Ground Based Augmentation System (GBAS) was introduced to replace the Instrument Landing System (ILS) to provide accurate navigation information during aircraft take-off and landing, thereby increasing runway throughput. However, radio signals propagating through plasma irregularities in the ionosphere at low latitude regions like Malaysia (4deg12'N, 101deg58' E) have a high probability of experiencing rapid fluctuations especially in the signal amplitude known as amplitude scintillation. The aircraft navigation supported by GBAS is susceptible to ionospheric scintillation. The data used in this paper were collected by the Civil Aviation Authority of Malaysia (CAAM). Selected amplitude scintillation events from the data were used to simulate scenarios in a GSS6700 Spirent Simulator representing amplitude scintillation effects on GBAS performance. It was proven through simulation that amplitude scintillation could degrade the integrity of GBAS which may have important implications for aviation safety.