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Nighttime Ionospheric Propagation of MF Radio Waves for DGPS

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DGPS signals are transmitted on maritime MF radio beacon signals(300 kHz frequencies) to enhance the accuracy of GPS, and also to broadcast the warning information such as unscheduled outage of GPS.For the efficient frequency utilization for DGPS stations, the same frequency is assigned to the DGPS stations more than a few hundred km away from one another.However the radio waves from the different stations with the same

frequency interfere one another locally at nighttime.In this study, we calculate the sky wave field strengths of MF (300 kHz)

over short distances (1000 km) by using Full Wave technique which calculates the electromagnetic fields in the ionosphere, and measure the actual field strengths over the Japan Sea of a maritime radio beacon signal (305 kHz) transmitted from the Hamada DGPS station.