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TITLE: Effects of Earth's curvature and conductivity on the spheric ground wave

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ABSTRACT BODY: We use Stanford full-wave method (StanfordFWM), which was designed for calculation of electromagnetic waves in stratified media and now has the capability of modeling media in curvilinear geometries, to calculate propagation of the electromagnetic pulse from lightning, i.e., spheric. In this study, we concentrate on the effects of the Earth's curvature and conductivity on the ground wave, i.e. the wave which has not been reflected from the ionosphere. We quantify, in particular, the reduction of the wave amplitude which due to obscuration of the line of sight. We also discuss the effects of the ground conductivity and the crossing of the land-sea boundary. StanfordFWM outputs are verified by comparison to analytical results [Wait, 1956 and later publications] as well as the results of FDTD (finite difference time domain) modeling. The model results are used to infer the characteristics of the parent lightning return strokes by analyzing the data of LF-VLF receivers recorded during this summer aboard a research vessel [Zoghzoghy et al, 2013, this conference] as well as by GLD360 network.

KEYWORDS: 3324 ATMOSPHERIC PROCESSES Lightning, 0644 ELECTROMAGNETICS Numerical methods.

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