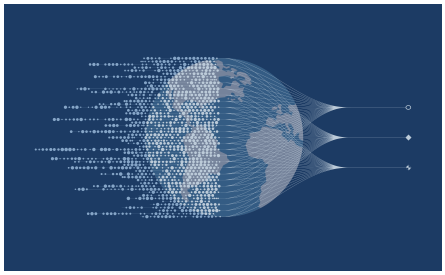

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investigation of Lg blockage in the Middle East

Lg blockage occurs when the Lg phase has anomalously low amplitude compared to the Pg phase. This phenomenon is often observed for paths crossing oceanic crust, but it is also seen in some continental regions such as the Middle East. Lg blockage is problematic for explosion monitoring because Pg/Lg amplitudes are commonly used as a discriminant; therefore, Lg blockage can cause earthquake seismic signals to attenuate, resulting in an explosion-like seismic signal. In this study, we use SPECFEM3D to investigate Lg blockage in the Middle East, incorporating state of the art crustal and attenuation models to simulate Lg propagation to IMS stations from regional earthquakes. We model both Lg-blocked and Lg-unblocked paths. The full waveform crustal models we use are constructed using long period waves (< 0.1 Hz), so it is unclear if these models can properly reproduce Lg wave amplitudes, which are typically observed at much higher frequencies (>2 Hz). Our study will demonstrate the reliability of current crustal models at predicting Lg blockage in the Middle East at IMS stations, which in turn can help identify events with low Lg amplitudes as a result of Earth structure rather than source type. LA-UR-25-20197

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