Electromagnetic Modelling for the Web: Building HTML5 visualizers in Exploration Geophysics

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Recent developments in web technology have enabled a viable cross-platform alternative to traditional desktop applications in geoscience software. Lamontagne Geophysics Ltd is completing an ecosystem of geoscience modelling and survey design tools that leverage this technology to provide an accessible means to explore electromagnetic data. The tools employ scalable vector graphics (SVG) to plot data and survey designs in high quality printable format, while the use of webGL has enabled the visualization of virtual geological scenes in 3D (Fig. 1). Although most calculations are performed directly in the browser, we export models to a server running a modelling engine for more computationally intensive processing. These models are saved as an editable JSON file, however optimization for larger datasets will be necessary. By presenting these tools, we demonstrate how web-based technology is ready for the challenges inherent in visualizing and modelling problems in exploration geophysics and geoscience in general.
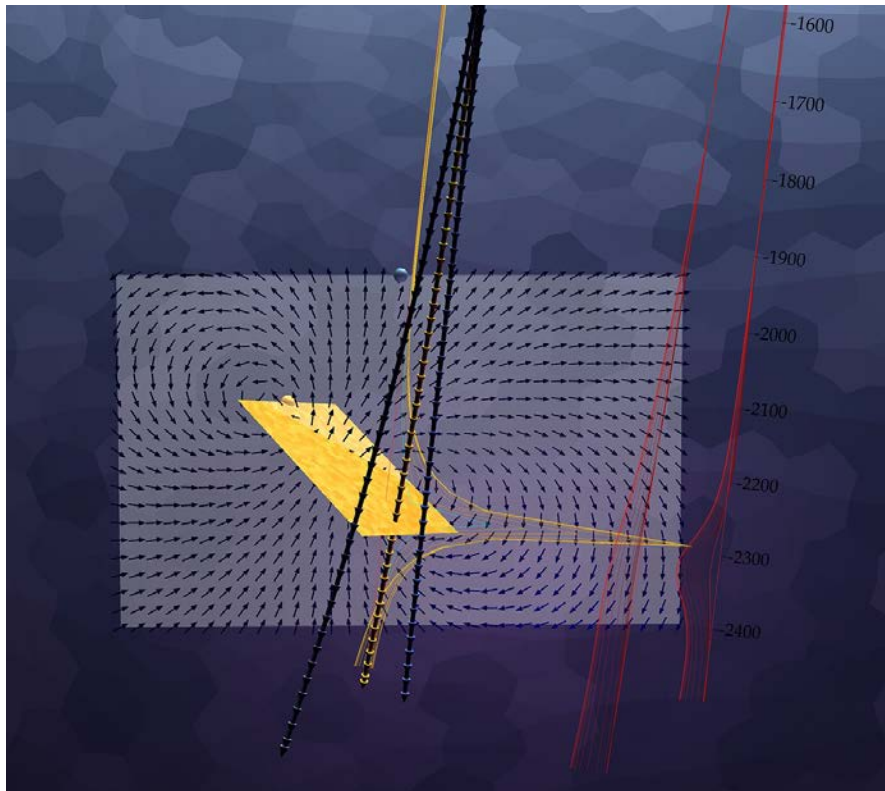
Figure 1: A 3D Scene of an electromagnetic model rendered in the browser using webGL. A large curved mesh is the backdrop for a conductive plate. A vector plane indicates the direction of the secondary field, three boreholes display the modelled EM response at depth (w-component,in-hole anomaly highlighted).