

New Technology to Acquire, Process, and Interpret Transient EM Data

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Abstract/Excerpt

We describe the multi-transient electromagnetic method and focus on new technology for realtime quality control and rapid interpretation of subsurface resistivities for both land and marine environments. The amplitude of the transient EM impulse response decays with offset r as $1/r^5$ and the corresponding step response decays as $1/r^3$. Parameters that must be optimized to maximize the signal include: input current; source bi-pole length; order of the pseudo-random binary sequence (PRBS) source time function; and source bit rate. By exploiting the symmetry of the bi-pole field of the source we are able to measure noise essentially uncontaminated by the signal and use this measurement to reduce the noise in the transient EM measurements. The variation of the arrival time of the peak of the earth impulse response with offset can be mapped to an apparent interval resistivity, creating a pseudo-resistivity section beneath the line. We plan to illustrate the concepts presented here with both land and marine data.