AN UNDERGROUND ELECTROMAGNETIC SOUNDER EXPERIMENT

by

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Abstract

An electromagnetic sounder developed for an archaeological application in Egypt has been successfully tested in a California dolomite mine. Chambers in the mine 100 to 130 feet from the surface gave intense, well-defined echoes consistent with an average attenuation coefficient of 0.6 dB/m and a relative dielectric constant of 11. By moving the transmitter and receiver units on the hillside above the underground chambers, various characteristics of the propagation could be observed such as dispersion, chamber aspect sensitivity and cross section. The transmitted pulse was one to one-and-a-half radio-frequency cycles long at a peak power of 0.2 MW. Frequencies employed were 16 to 50 MHz. The light weight, highly portable, battery-powered equipment is potentially suited to other underground sounding applications.