

'MAGNETOTELLURIC (MT) INVESTIGATIONS AT NAIROBI'


by

TIMOTHY JOAB ODERA

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This thesis is my original work and has not been
presented for a degree in any other University.


Timothy Joab Odera

This thesis has been submitted for examination
with my approval as University supervisor



Professor N. J. Skinner, Head,
Department of Physics.

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ABSTRACT

A short historical introduction of the Earth's electrical conductivity studies is presented. A brief review of early and recent conductivity studies is given, and the results obtained by different methods of conductivity measurements from various places (including Africa) are discussed. The Earth's main conductivity regions based on the general conclusions by different workers are described.

The basic theories and equations of the magnetotelluric method are reviewed. Simplified electromagnetic induction equations are given and the basic techniques of the magnetotelluric sounding according to Cagniard's formulation are discussed.

The magnetotelluric instrumentation system used at Nairobi is described and methods of data acquisition of the station are presented. Finally the experimental results are fully described and discussed. The statistical analysis for obtaining Fourier coefficients is described and the resistivity profiles obtained at the intervals of $6 \times 10^2 - 10^5$ s or ($10^{-5} - 1.3 \times 10^{-3}$ Hz) are interpreted according to Cagniard's method in terms of a three-layer Earth model.

The possibility of ultimate conducting level is estimated to be 170 km depth at Nairobi, Kenya.