

MAGNETIC INVESTIGATIONS EAST OF MALAITA ISLAND

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN OCEANOGRAPHY

August 1969

By

Peter D. Segeo

Thesis Committee:

Alexander Malahoff, Chairman
James E. Andrews
John C. Rose

ABSTRACT

A structural analysis of shipborne total intensity magnetic data northeast of the island of Malaita has been carried out. The residual total force magnetic anomalies, with a few exceptions, indicate normal polarization. Anomalies of 600 gammas amplitude are observed over a scarp which forms the outer limit of the island platform. No significant anomalies are associated with a deep at the base of the scarp. Lower amplitude anomalies of 50 gammas are present over a rise which strikes parallel to the island and changes direction in a curve north of the island. An anomalous zone of 400 gammas amplitude is observed over the western flank of the rise. The anomalous bodies are best approximated by elongate models, with the major axis striking at north 60 degrees west. Two depth estimates to the top of the body below the ocean floor give a depth of 15 kilometers to the source under the rise and a depth of 9 kilometers under the scarp. There is a prevalent bipole trend of elongate residual anomalies paralleling the strike of the rise. The observed residual magnetic anomalies are associated either with the scarp or a zone of maximum tension along the rise. No "sea floor spreading" type lineations were observed over the oceanic crust northeast of Malaita.