

ABSTRACT

STRUCTURE ANALYSIS AND MODELLING SUBSURFACE BASED ON ANOMALY GRAVITY DATA IN SURROUNDING LAKE TOBA NORTH SUMATRA PROVINCE

By

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Lake Toba located in Province North Sumatra is a very large volcanic caldera and surrounded by the rock group the result of volcanic eruption. This study uses Bouguer anomaly data from <http://topex.ucsd.edu>, Second Vertical Derivative and 3D inversion modelling in the study area.

The study area has a Bouguer anomaly between -40 mGal to 180 mGal, high Bouguer anomaly values have a value range of 140 mGal to 180 mGal located around Lake Toba and has a dense anomaly contour, and low Bouguer anomaly values has a range of values up to -40 mgal 30 mgal located in the southwest and northeast of research areas with the contour anomaly that is looser than in the middle area of research. To determine the presence of a fault in the area of research conducted filtering Second Vertical Derivative (SVD) on Bouguer anomaly maps , Regional, and Residual . Pattern fault structure is indicated with zero contour and flanked by high and low contour.

3D inversion modeling Bouguer anomaly indicate the presence of magma kitchen Lake Toba with high density values than are in the surrounding area . Lake Toba has a giant magma chamber is located at depths of more than 10,000 meters at the bottom surface.

Keyword : Lake Toba, Gravity, North Sumatra Province