Geophysical Research Abstracts
Vol. 20, EGU2018-15221, 2018
EGU General Assembly 2018

Geophysical and Geological Modelling of Nemrut Volcano, Bitlis, Eastern Turkey

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Quaternary active Nemrut volcano, adjacent to Lake Van, is one of the highest mountains of Eastern Anatolia (Turkey) and is situated 12 km north of the Bitlis-Zagros suture zone. Its activity backs to $\sim$ 1 Ma ago and the recent ones were in 1441, 1597 and 1692 A.D. The area covered by the volcano is approximately 486 km^2. There is an elliptical caldera at the apex of the Nemrut volcano. Intra-caldera hydrothermal and fumarolic output, low-level volcano-seismic events are current activities. The caldera has four hot ponds (small lakes), a lava center, lava funnels, splashes, hot water springs and six caverns as to its current activity and a large water lake as well. Two of the lakes exist permanently and the others are seasonal. Lake Nemrut having a maximum depth of 176 m is the largest of the lakes and is situated at an elevation of about 2247 m. It has a surface area of 15 km^2.

Although some comprehensive geological studies have been reported in the literature, Nemrut caldera system representing a typical example of volcanic activity has not been modelled geophysically before. Thus in order to fill this gap, an attempt was made by using gravity and aeromagnetic data sets of the region. The datasets were obtained from General Directorate of Mineral Research and Exploration (MTA) of Turkey. Some derivative-based techniques and 2- and 3-D modelling of geophysical anomalies yielded some noteworthy findings that helped us to reveal some geological implications.

Keywords: Nemrut Volcano, Caldera, Gravity, Magnetic, Modelling, Geological Implications