3Dmagnetic modeling of damavands magma chamber and seismic concepts

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There is little information of Damavands magma chamber in volume,spatial and its dimensions. This strato-volcano situated 60 km northeast of the Tehran, is a large Quaternary composite cone, 5670 m peak which includes trachyandesite lava and pyroclastic deposits overlying the bending location or hinge of the Central Alborz ranges.The seismotectonics of the area is influenced largely by the most prominent Mosha fault, an active, high dip angle with length of400 km (Berberian et al, 1993), that had experienced several destructive earthquakes,(Berberian and Yeats, 2001). Seismo-volcanic interaction of seismic faults around the volcano edifice is not known.An issue that would be complex problematic if, the volcano or this part of the fault becomes activate.Most of recent micro-earthquakes have occurred in the southern flank of the Central Alborz and the south of the Damavand volcano, mainly in the approximate east-west trend part of the Mosha fault (Abbasi,et al2010).Recent studies have illustrated magnetic anomalies at3 to6 km depth levels were mainly located under the main edifice cone of the volcano (Oskooi and Omidian, 2010).Other studies have shown, the edifice is composed of two cones that the earlier located SW of the older ones. A low velocity zone at depth of 7 km beneath the volcano and relatively high velocity body in the southern side of the volcano is considered as the magma chamber and the fractured zone of the Mosha fault,respectively (Mostafanejad, et al., 2011).In this study the 3DMAG (UBC) modeling software is executed several times to recognize the susceptibility changes versus depth. The inversion program generates a three dimensional block model that shows one possible subsurface distribution of the susceptibilities that could generate the observed data. The magnetic data are interpreted in the geological structure models to detect the3D distribution of the susceptibility and to produce a more geophysical interpretable model.First the aeromagnetic data is used to model the volcano for initial view of the magma chamber relevant to the observed anomaly.Then by help of the well-located micro earthquakes in the neighboring Mosha fault zone at the south of the volcano and by the mag3D estimated model, a better perspective of the magma chamber is presented.There is no reliable micro-seismic event between the Mosha zone and at least 5 km around the cone axis in the south of the volcano at 5 to 20 km depth ranges. The results illustrate two distinct anomalies at3and8 km depth which may be relevant to the intersected twin cones that had erupted in different times. This model is in comparable with the recent studies.Our studies could lead us and authorities to make more precise decisions in future site selection of the prospect seismic and or magnetic observatories for an understanding of the next probable volcanic activities.