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Geophysical insights on the deep structure of Ciomadul volcano through interpretation of potential field data

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Pliocene–Quaternary magmatism characterizes the South Harghita Mountains which form the southern part of the Calimani-Gurghiu-Harghita volcanic chain. South-easternmost located of this chain, not far from the Vrancea active seismic area, Ciomadul volcano seems to mark one of the latest episodes of the post-collisional volcanism within East Carpathians.

Several challenging aspects, such as (i) the major heat flow anomaly, (ii) abrupt attenuation of seismic waves, (iii) the deeply located low velocity zone, (iv) associated earthquake hypocentres and (v) petrologic and magnetotelluric constrains on the magma storage, seem to favour the idea of the presence of a magma chamber beneath Ciomadul volcano.

Recently conducted geomagnetic and gravity surveys in the area have allowed for some new insights on the in-depth structure of the volcanic edifice. Joint inversion and forward modelling of the potential data was mainly used for deciphering the lateral and in-depth development of the volcanic structure.

The paper proposes some 2D and 3D tentative interpretative models of the potential field data. Lab rock physics determinations on samples collected from the study area and additional geophysical information are used to constrain the revealed structures.

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