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The deep sources of the Neapolitan Volcanism (Southern Italy) from potential field data interpretation

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A large low-density body was evidenced from earlier gravity and magnetic modelling in the Campanian area (Italy). The body was extended about 60 several tens of km and deep from about 8 km down to 13 km of depth. This was explained as mainly due to the thermal (high temperature) and compositional (trachybasalts) properties of the source rocks. Magnetic anomalies also showed an uprising of the Curie isothermal surface I that area, explained by high geothermal gradient too. Whether geophysics seems so evidencing a large area of molten material 8 km bsl, modelling in terms of a single and very extended low-density (magmatic) body could not be completely acceptable by a volcanological point of view. A 3D modelling of the gravity field is presented, helping to define at the same depths a low-density structure, extending below all the main Campanian volcanic area. More recently a seismic evidence of a quite extended magmatic sill confirmed such gravity-based hypothesis by detection of a low velocity layer at about 8 km bsl and with an areal extent of 400 km^2.

Here a new modelling procedure of the above gravity low is presented, in terms of a fractal 3D model of density, which may well represent a magmatic distribution in terms of melt pockets within solid rocks.