

## **Magnetotellurics reveals a hidden caldera and its relation to regional tectonics in the Cappadocia region, central Anatolia, Turkey**

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### **SUMMARY**

The Neogene-Quaternary volcanism in central Anatolia is characterized by ignimbrite sequences, and associated calderas have been partly dismantled and buried as a result of tectonic, volcanic, erosional and depositional processes, which cannot enable to identify of these structures from the surface expressions. To search the location of a concealed caldera, one of the probable ignimbrite source vents, magnetotelluric data acquired at 60 stations in the period range from 0.001s to 1000 s were used to derive an upper crustal three-dimensional electrical resistivity model in the Cappadocia region, central Anatolia, Turkey. The resistivity model provides constraints on the geometry and location of a buried caldera situated in the Çiftlik basin, which is characterized by a low resistivity ( $<10 \Omega\text{m}$ ) region coinciding with a caldera-like feature that is interpreted as a buried caldera complex (i.e., Çiftlik caldera) and attributed to the probable source area for the ignimbrites. The collapse and the burying process of the caldera complex have been linked with the transtensional tectonics of the Cappadocia region. The caldera margins are also compatible with the Quaternary fills of the Çiftlik basin and are bounded by faults related to the Cappadocian Volcanic Province fault system. Locating a buried eruption center beneath the Quaternary deposits may contribute to identify the source of Miocene-Pliocene ignimbrite emplacements.

**Keywords:** magnetotellurics, volcanism, caldera, Cappadocia

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