

***Interactive comment on* “Brief communication: Electron pair donors and Earth’s energy generation” by Frederick Mayer**

Anonymous Referee #2

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In the manuscript on "Electron pair donors and Earth’s energy Generation“ the author F. Mayer discusses an unusual concept for thermal energy generation in the earth based on "tresinos“ and "Cooper pair formations“ and he furthermore suggests that zones of high electrical conductivity found with magnetotelluric measurements may be caused by these.

The paper of Ritter et al. (1999) is cited out of context. It describes a significant electrical conductivity anomaly found beneath the Münchberger Gneismasse in Germany, which was interpreted to be a remnant of past tectonic processes. The high conductivity was attributed to graphite along shear planes. Graphitization was a plausible explanation for the highly conductive material because (i) graphite forms interconnected networks over large distances, necessary to be detectable with magnetotellurics, (ii)

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graphite remains in place and stable over geological time spans (millions of years), which is necessary in the absence of active tectonic processes, (iii) graphite has a self-lubricating effect, thereby facilitating movement along shear planes, and (iv) graphite has been found in other large fossil shear zones around the world. In active tectonic regimes and in general fluids (including for instance partial melts) play a dominant role in explaining high electrical conductivity within earth. In fact, a multitude of papers exist on the interpretation of high electrical conductivity, which favour much simpler and more coherent conductivity mechanisms and which are supported by data and observations. None of these are mentioned or cited by the author.

I cannot comment on the soundness of the concepts of "tresinos" and "Cooper pair formations" as this is not my field of expertise and these concepts are not explained in the manuscript. The connection to electrical conductivity within the earth's deep interior, however, is not substantiated, very speculative, and not supported by any data. The only reference to a paper on magnetotellurics is cited out of context. Important references are missing, I therefore strongly advise against publishing this manuscript.

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