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Solid Earth Discussions

Interactive comment on "Effect of chemical composition on the electrical conductivity of gneiss at high temperatures and pressures" *by* Lidong Dai et al.

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The electrical conductivity of gneiss samples is measured using multi-anvil presses at high-pressure high-temperature. Impedance spectroscopy is used but the paper focuses on the DC results only. The purpose of the paper is to complete a database on the conductivity of crustal rocks with the broad purpose of discussing electrical anomalies in continental crust. Several experimental surveys have been conducted by the same group on different crustal materials, including single crystals. A more specific purpose consists in explaining the Dabie-Sulu ultrahigh-pressure metamorphic belt, in China. This region might be better presented: both the geology and the geophysical

observations deserve a thorough explanation as the reader of Solid Earth is mostly not aware of this area. Regarding the data, we need more information on the run products and on the results: what is the phase proportion? What is (are) the interconnected phase(s) as this is defining the electrical path? Shall we suspect impurities such as carbon or hydrogen to contribute to the DC flow? How these measurements on a multi-phased system compare with the conductivity of individual crystals? How the conductivity compare with other works on, for example, sedimentary gneisses, such as Hashim et al. or Ferri et al? Could the conductivity anomaly in the Dabie-Sulu ultrahigh-pressure metamorphic belt be explained by crustal melting or brines as beneath the Tibetan plateau, on which a vast literature that is ignored here exists? I am looking forward to seeing a ms addressing this issue

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