

Interactive comment on “Impact of controlled changes in grain size and pore space characteristics on the hydraulic conductivity and spectral induced polarization response of “proxies” of saturated alluvial sediments” by K. Koch et al.

M. Tong (Referee)

tongms@163.com

Received and published: 17 October 2010

1. General comments: The manuscript by Koch et al. shows some results about the influence of the grain size and pore space on the relationship between the SIP response and hydraulic conductivity of the artificial samples. These results are useful for comprehensively understanding of SIP characteristics of the soil. But I thought that this

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paper needs to be revised. 2. Specific comments The following comments need to be considered: (1)In the “Experimental procedure and data analysis” section: (i) The experimental setup needs to be shown. (ii) What kind of impedance spectrometer was used? (iii) The silver wire was used in this paper. It has the electrode polarization, especially at very low frequencies. So the Non-polarizing electrodes need to be used to minimize effects of electrode polarization that can occur at the fluid/electrode interface, other than the used silver wire. (iv)How can the well contacting of the source and measuring electrodes with the samples be achieved? (v) How was the specific surface area of the samples calculated from the particle size distribution of the used samples? This parameter may be measured by the corresponding equipment. (vi)How was the porosity of the samples measured? (2)The author needs to clarify the inversion procedure. For instant, a typical SIP data can be constructed to estimate the Cole-Cole parameters. And the resulted parameters can be compared with the ones used in the SIP data constructing. (3)The relationship between the SIP parameters and the hydraulic conductivity of soil samples has been investigated for many years. Some references about this are needed to be added.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 6057, 2010.

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