

Interactive comment on “Dielectric database of organic Arctic soils (DDOAS)” by Igor Savin et al.

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Comment 1. I believe there are a couple of typographical errors, with the temperature-controlled chamber being referred to as a “camera” in the publication.

Answer to comment 1. In the new version of the manuscript, with regarding you comment, the term “camera” has been changed to the term “temperature chamber” as pointed out in manual to the device.

Comment 2. The data set for Samoylov Island (SI) is smaller than the other data sets, leaving readers to speculate about the reason. I think it would be helpful to include a brief explanation for this in the publication.

Answer to comment 2. For various locations the datasets are differ, due to the fact that they were obtained at different times from 2007 to 2017, and for different purposes,

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such as creating a model, or testing existing models (as in the case of the Samoilovsky Island soil). That is why the dataset for Samoilovsky Island is much smaller than the others. We intend to expand this database and over time new soils will be added and additional measurements of soils from Samoilovsky Island will be carried out.

For clarification, the following sentence has been added at the Table 2:

“This is due to the fact that the datasets were obtained at different times, from 2007 to 2017 for various purposes and projects, such as creating models, or their testing.”

Comment 3. Error estimates and potential sources of error would also help to understand the limitations of the data set. It would also help to provide a measure of the uncertainty of key parameters.

Answer to comment 3. The estimation of measurement errors is described in detail in (Mironov, V. L., Komarov, S. A., Lukin, Y. I. and Shatov, D. S.: A technique for measuring the frequency spectrum of the complex permittivity of soil, *J. Commun. Technol. Electron.*, 55(12), 1368–1373, 2010; Mironov, V. L., Molostov, I. P., Lukin, Y. I. and Karavaisky, A. Y.: Method of retrieving permittivity from S12 element of the waveguide scattering matrix, in 2013 International Siberian Conference on Control and Communications (SIBCON), pp. 1–3., 2013.).

We have inserted links to these publications at the end of Section 3. We also added additional text for clarifying:

To obtain the dielectric spectra of soil samples using the measured values of S11, S12, S22, and S21, an algorithm developed in (Mironov et al., 2010; Mironov et al., 2013b) was used assuming that only the TEM wave mode propagates in the coaxial cell in the frequency range 0.05–15 GHz. In detail the sources of hardware and measurement method errors describes in the articles (Mironov et al., 2010; Mironov et al., 2013b).

Comment 4. Regarding the standard deviation measure used in the automation procedure, what are the units of the S12? I think it should read “0.01 dB.” Also, how

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many samples are considered in computing the standard deviation? Is it every value measured since the last temperature change? A moving average? It would be helpful to clarify this, because it gives the reader a better idea of the uncertainty in the measurements.

Answer to comment 4. Yes, the unit of the standard deviation (SD) of S12 is dB. Corrected in text. For SD calculation was used 800 points (evenly distributed in frequency range). Moving average was not implemented (the signal is stable and not noisy). For clarifying measurement process the next text in Section 3 was rewritten:

“After the temperature control system switched the temperature chamber to a predetermined temperature, and this temperature was set inside the temperature chamber, control of the standard deviations between the S12 spectra, which were measured every minute, began. When the standard deviation between the current data and the recorded one minute earlier decreased to below 0.01 dB, the system recorded all the spectra of the S-matrix and switched the camera to the next designated temperature point, after which the whole process was repeated.”

A new text reads as follows:

“During the measurement, the temperature of the chamber was set by software. After the thermodynamic equilibrium is established in the chamber (monitors by the chamber), the S12 value starts to be read every second (to monitor of thermodynamic equilibrium, which establish in the sample). If standard deviation between two successive measurements of S12 becomes less than 0.01 dB, then all S parameters measures, and then next temperature in chamber was set and the process was repeated.”

Comment 5. ...it could benefit further from correcting some grammatical errors and typos. Answer to comment 5. Corresponding corrections were made.

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