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BOINC-based comparison of the geoacoustic inversion algorithms efficiency

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The BOINC-based volunteer computing project Acoustics@home was employed to study the accuracy of the sound speed profile reconstruction in a shallow-water waveguide using a dispersion-based geoacoustic inversion scheme. This problem was transformed into a problem of black-box minimization of a certain mismatch function. According to the first approach, a sound speed profile is considered a piecewise-linear function with fixed uniformly-spaced nodes. At these nodes, the values of sound speed are obtained in the course of inversion. In the second approach the depths of the sound speed profile nodes are also considered inversion parameters, however, their number must be smaller than in the first approach due to the computational complexity limitation. Several large-scale computational experiments reveal that for the considered problem the second approach leads to a more accurate sound speed profile estimation.

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Primary author: Dr ZAIKIN, Oleg (Matrosov Institute for System Dynamics and Control Theory SB RAS)

Co-authors: Mr KUROCHKIN, Ilya (IITP RAS); Dr PETROV, Pavel (V. I. Il'ichev Pacific Oceanological Institute FEB RAS)

Presenter: Dr ZAIKIN, Oleg (Matrosov Institute for System Dynamics and Control Theory SB RAS)

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