1046-86-1569   **Elchin E Jafarov*** (`fteej@uaf.edu`), PO BOX 750686, Fairbanks, AK 99775, **Dmitry J Nicolsky** (`ftdjn@uaf.edu`), Geophysical Institute, PO BOX 757320, Fairbanks, AK 99775, **Victor S Mikhaylov** (`ftvsm@uaf.edu`), 101 Chapman hall, Fairbanks, AK 99775, and **Vladimir E Romanovsky** (`ffver@uaf.edu`), Geophysical Institute, PO BOX 757320, Fairbanks, AK 99775.
Inverse problem of heat conduction, reconstruction of the temperature profile.

Quantitative reconstruction of the temperature field backwards in time requires a numerical tool for solving the inverse problem of heat conduction in fully saturated soils. In this paper we present a variational approach to one-dimensional numerical restoration of thermo-conductive heat flow with temperature-dependent conductivity, heat capacity and volumetric water content. This approach is based on a search for the soils temperature by minimizing differences between present-day temperature measured by installed temperature sensors and the predicted by forward model of heat flow for an initial temperature guess. To demonstrate the applicability of this technique, we show that the initial temperature profile of the heat flow can be numerically reconstructed with some allowed inaccuracy from the true initial distribution. (Received September 16, 2008)