IceCube Polar Science Workshop



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HOW WARM IS THE SOUTH POLE?

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The Antarctic geothermal heat flux (GHF) has significant influence on the viscosity of basal ice and meltwater content at the ice-base interface. To evaluate GHF under the Antarctic Ice Sheet at South Pole, we used available temperature profile taken by AMANDA and IceCube thermistors installed at depths from 800 m to 2445 m in boreholes produced with hot-water drilling. We applied one-dimensional time-dependent energy-balance equation to model the temperature distribution through the ice as a function of the climate conditions on the surface and the GHF from the bedrock. To overcome model uncertainties, a common genetic algorithm was used to find the optimal global solution of temperature fitting by constraining unknown parameters to a predetermined range. In this report we present GHF estimates at South Pole and analyze the main uncertainty in our fitting model that come from variability of the form factor m.

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