

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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