

ICECUBE DRILLING

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IceCube is planned to be a Cubic Kilometre size Neutrino detector array located between 1450m and 2450m below the surface of the ice sheet near South Pole station. The array will eventually consist of up to 80 strings. Each string will be made up of 60 down hole sensors plus 2 surface sensors placed in 2.5 cubic metres of manufactured ice located at the surface. The surface sensors make up the IceTop array which is part of the total IceCube array. The grid will eventually consist of around 5000 down hole sensors with strings spaced 125m apart in a triangular grid and with detector separation of 17m along each string. Each hole will need to be drilled down to 2500m and must have a specified minimum deployment lifetime. For the project to be completed in a feasible time frame, holes need to be drilled at the rate of up to 18 per field season during full production drilling.

This talk will focus on the method used to drill these holes, on the drill system required to achieve the hole production rate required, the problems that were encountered with the system during the first two field seasons and on the logistical issues and constraints that need to be overcome to achieve these production rates. 9 holes have so far been drilled, with 8 having been completed during the 05-06 field season. Data from drilled holes will be presented showing drilling rate, fuel usage per hole, hole diameter and other data collected during the drilling operation.