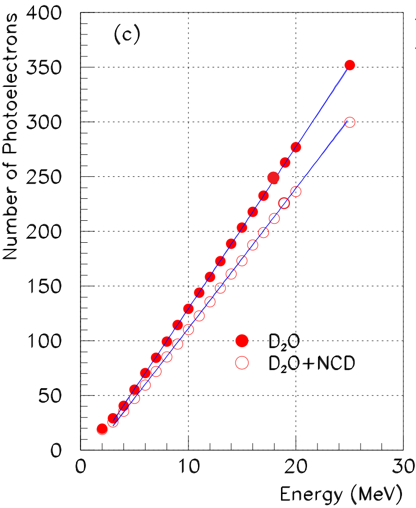
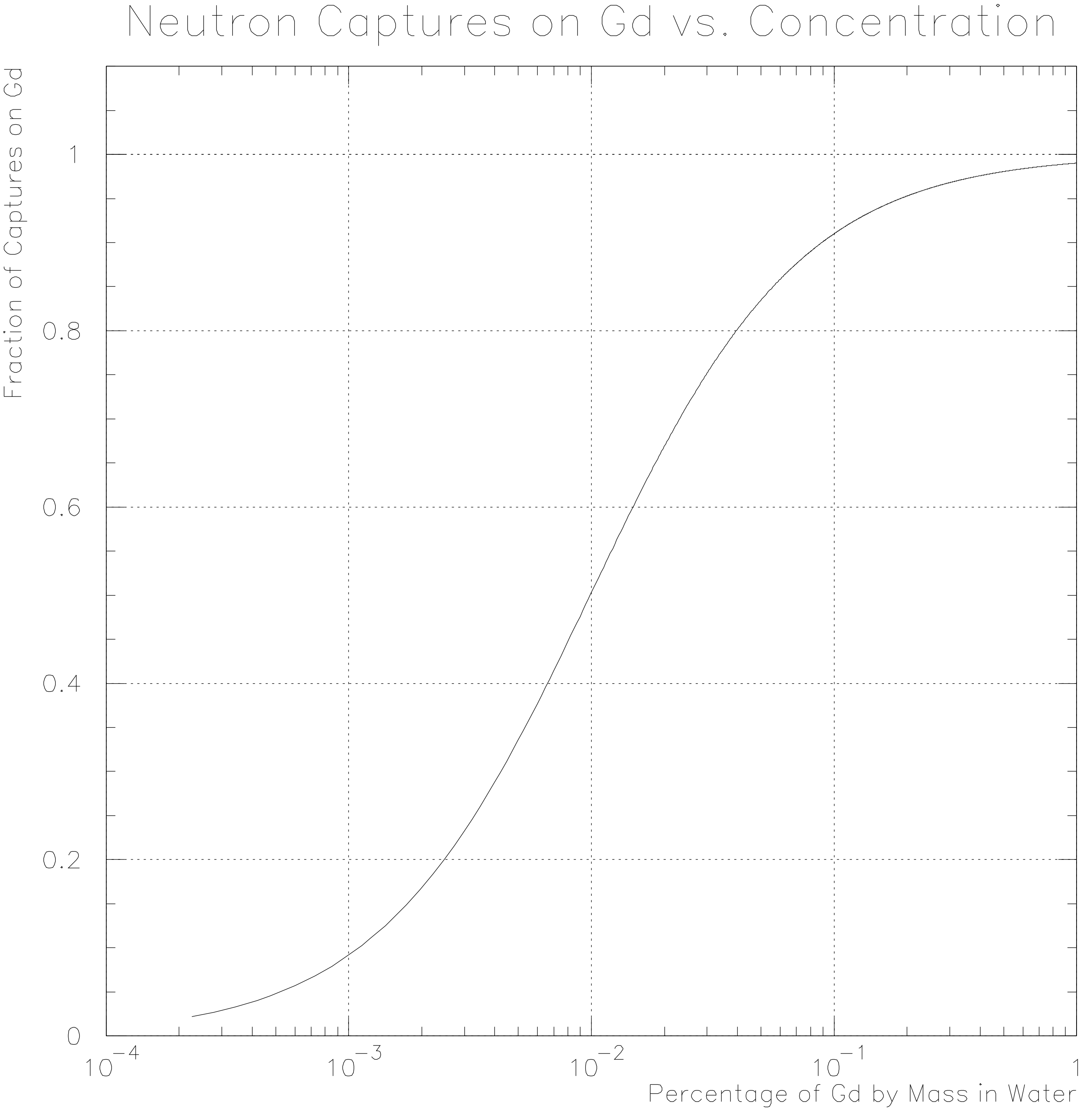

(c)
Number of Photoelectrons
Energy (MeV)
D_2O
D_2O+NCD
0
50
100
150
200
250
300
350
400
0
10
20
30


Neutron Captures on Gd vs. Concentration
Fraction of Captures on Gd
0
0.2
0.4
0.6
0.8
1
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
Percentage of Gd by Mass in Water

At Super-K, a calibration source using $GdCl_3$ has been developed and deployed inside the detector:

Am/Be source

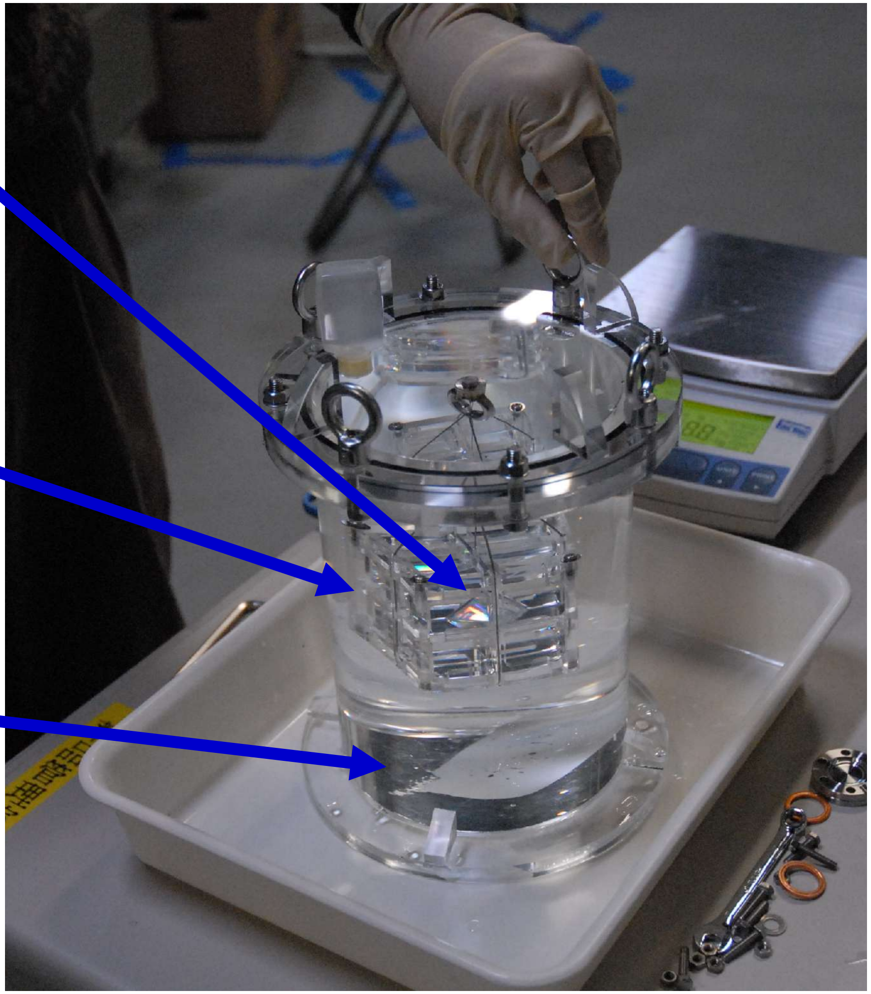
$\alpha + {}^{9}Be \rightarrow {}^{12}C^{*} + n$

${}^{12}C^{*} \rightarrow {}^{12}C + \gamma(4.4\ MeV)$

Inside a BGO crystal array

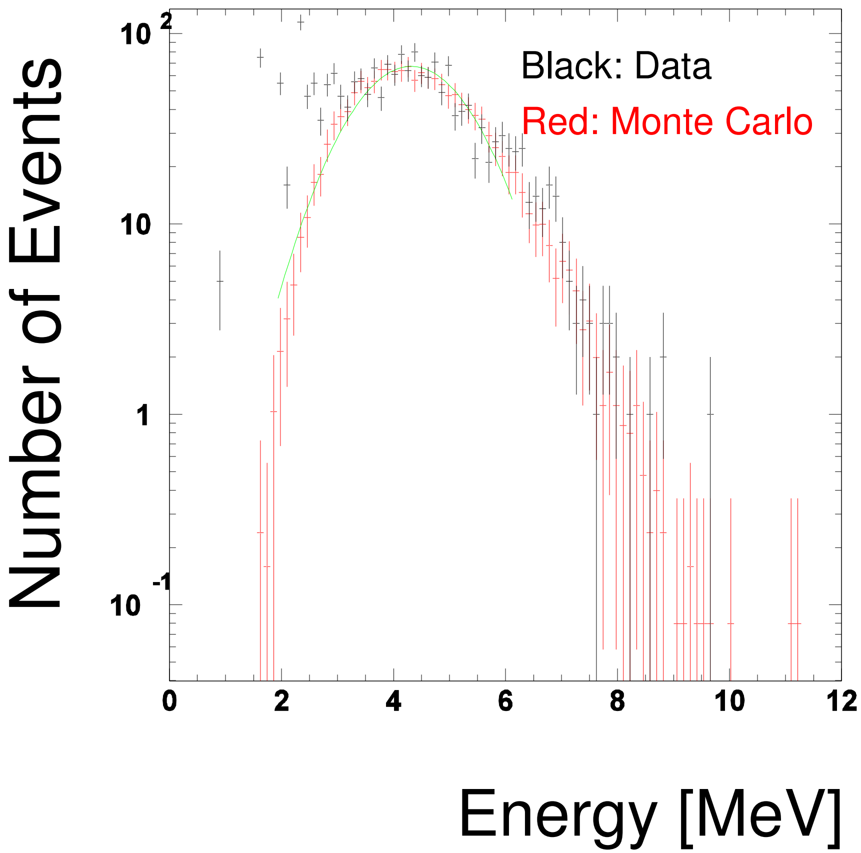
($BGO = Bi_4Ge_3O_{12}$)

Suspended in 2 liters of 0.2% $GdCl_3$ solution



Data was taken for the first time earlier this year.

We've made the world's first spectrum of $GdCl_3$'s neutron capture gammas producing Cherenkov light!



More study (and data) needed, but a really promising early result!

Also, first $GdCl_3$ "in" SK!