Quicky Tutorial on Using Dragon-Midas Acquisition System

LOGIN -

Normally midmes01 is left logged-in, and showing one of four screens. Most control functions are done from screen-2 which may be selected by clicking on one of the numbered buttons at the center of the bottom toolbar. Screen-2 shows three "paw" windows and one "odb" window. If not already logged-in, a dialog box and Midas logo should occupy the full screen.

To login, enter Username:dragon and Password:dragonTail. When the bottom toolbar appears, click once on the Midas logo button at its center. This brings up several windows, which takes about 20 s, so be patient. When the "dragon_menu" window appears: (1) on screen-3 type "analyzer -l" in the yellow window which echos back "Running analyzer online". (2) On screen-2 type "cd /data/dragon/dataN;paw++&" in the "odb" window, where "dataN" is the subdirectory selected for logging, as described in the last section below. (3) Type "odb" which should echo the odb prompt, "...Stopped]/>". (4) On screen-1 type "dio dragon" in the top-right window, which echos several messages ending in "N18 ...000". If it echos "No PCI or ISA cards found" check the power on the Camac crate, turn it on if necessary, and repeat this step. (5) In the "mstatus" window (top left of screen-1), check that the essential "Clients" are listed, Logger, ODBEdit, Analyzer, and dragon. If any of these 4 names are missing, logout/in again and if that doesn't work, reboot as described in the LOGOUT section below. (6) Check data acquisition by typing "start" in the odb window and see that histogram #1000 is accumulating gamma-singles data.

COMMANDS -

Commands to control acquisition can be typed in the odb window. Type "help" to list all the commands or consult "Midas" on the TRIUMF web page. To use the Netscape interface to Midas, consult the document "How to start Midas" in the DRAGON counting room. Some useful Midas commands, like "save" and "load", and use of wildcards "*" and "..", can only be done in the odb program, not Netscape.

The functions of screen-2 can be duplicated on isdaq03 and/or isdaq04 by typing "ssh midmes01" in any shell window, followed by steps (2-3) above. The same three paw windows and odb prompt, as described above, should appear in the shell window. To get access to handy paw features, select "Style Panel" from the pull-down menu at the bottom of paw's "Graphics" window. Also, select "Titles" under "View" in the paw Browser window, which displays essential histogrm titles in the Browser window. To display an online histogram, click on "ONLN" in the Browser window, then double click on the icon next to the title of the desired histogram. For more information on histogram display, type "help hist/plot" in the paw "Executive Window".

LOGOUT -

If the windows become corrupted and no longer function, they can usually be fixed by logging-out and in again. To do this, select the clock icon just left of the time-of-day display on the bottom toolbar. If the screen freezes with "Preparing session" displayed, type Ctrl+Alt+Backspace

to un-hang. The "DAQ Midas" login banner should appear in a few seconds.

If all else fails, select "Shutdown" + "Reboot" from the banner.

ERROR MESSAGES -

Sometimes the Analyzer crashes or the disk fills, which "stops" a run. An error message appears spontaneously in each odb window and in the Netscape message box near the bottom of the "Midas status" window. If the analyzer crashes, it must be reloaded as per step (1) above. If the disk fills, old files must be removed, using the Linux "rm" command, to make room for the new .mid files.

Following a power outage, follow these steps to get started. The lower NIM bin has a flakey -12v supply which will only start if one of the 612 amplifiers is unplugged by sliding it part way out. It can be plugged in again with power still on. The sign that the power is OK is that the red light is flashing on the Ortec 935 CFD in the center of the bin. If not, try again, or use a DVM to check the -12v power.

An HV message following "start" means the Lecroy HV4032A needs restart: (1) Turn the key off/on on the supply. (2) Switch the supply to "LOCAL" using the black switch. (3) Press the white "HV ON" button once and verify that the red "HV-ON" light lights. (4) Return the black switch to the "REMOTE" position. (5) Load the utility program, /home/dragon/calib/hvcontrol/hvcontrol, by typing its name in any shell window while acquisition is still in the "Running" state. The program echos many messages ending with "HV Control ready". (6) Type "stop" to the odb. (7) Type "set /Equipment/gTrigger/Settings/ChangeHV y" to the odb, which echos many lines ending with "HV Hardware set". (8) Check that dragon is happy by typing "start" and see that histogram #1000 accumulates gamma-singles events.

FREQUENTLY CHANGED ODB VARIABLES -

"/Logger/Data dir" = string specifying the disk directory for event-logging(.mid) and histogram(.hbook) files. A typical string value is "/data/dragon/dataN", where "N" is an integer specifying one of the existing subdirectories on midmes01.

/Equipment/gTrigger/Settings/Prescale_factor is typically 50 to log 2% of the gamma singles. The gamma singles count before prescaling is acquired as /Equipment/Scalers/Sums/Gammas_presented. Each logged event consumes about 100 bytes of disk space.

/Equipment/gTrigger/Settings/CFD_Thresholds should be about 20 for 2 MeV gamma threshold, lower for lower thresholds. Tables of threshold values are maintained in files /data/dragon/data0/XXXthresh.odb where "XXX" is the threshold value in ADC channels (XXX = 100 means 1 MeV, etc.) To change the CFD threshold to a new energy, type "load file" to the odb, where "file" is a name of the form /data/dragon/data0/XXXthresh.odb.

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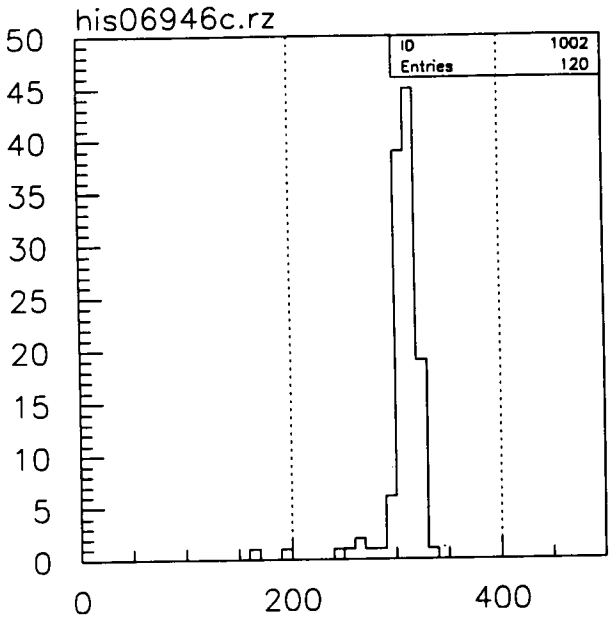
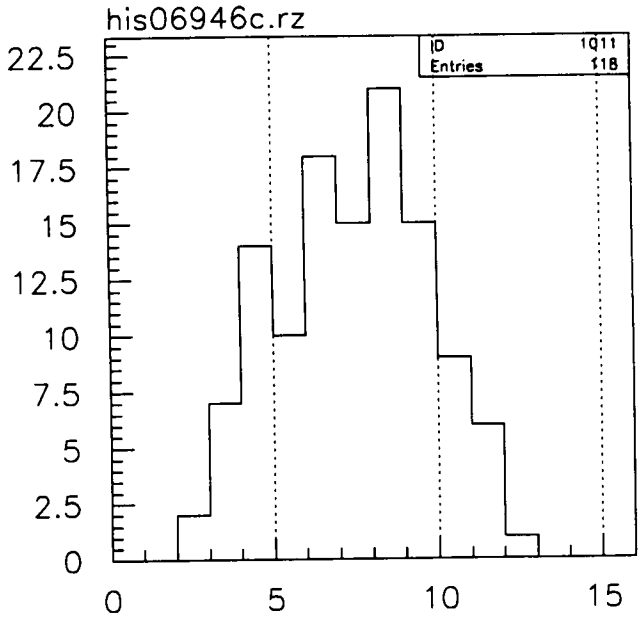
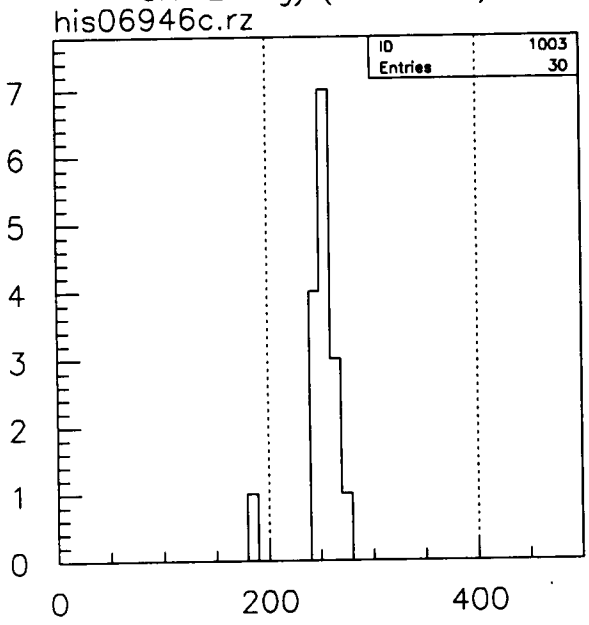
386.7 keV/u $^{14}N(\alpha,\gamma)^{18}F$ Reals and 8x−Randoms DSSSD Spectra



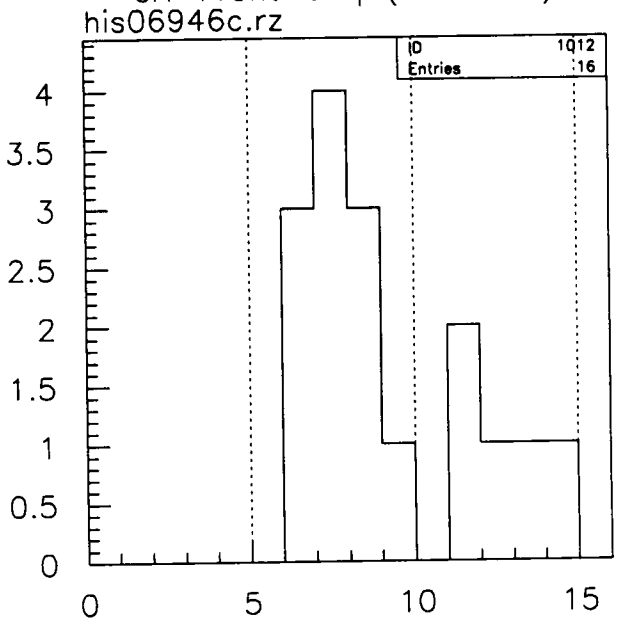
cH−Energy (Mask=11)



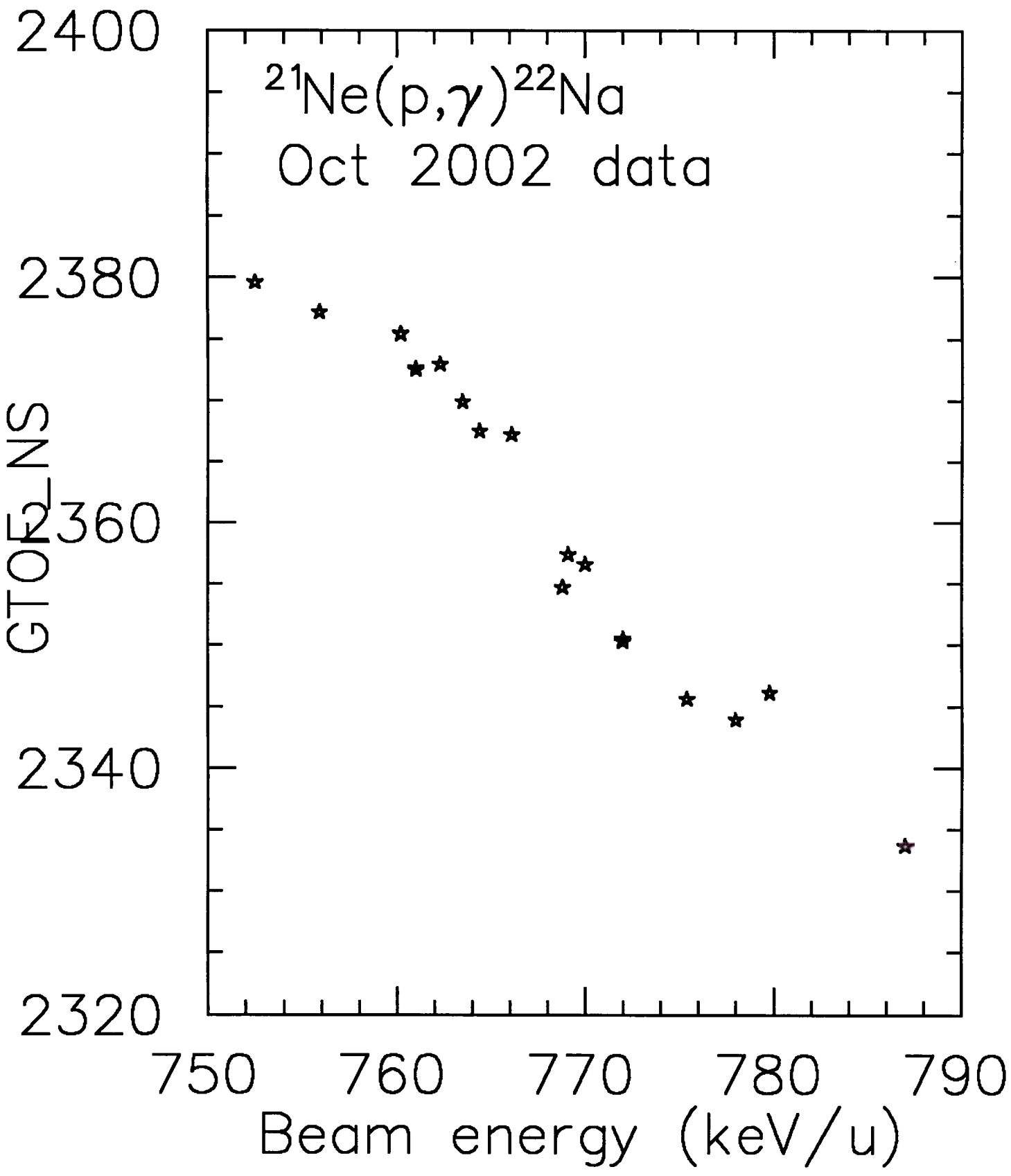
cH−Front−strip (Mask=15)

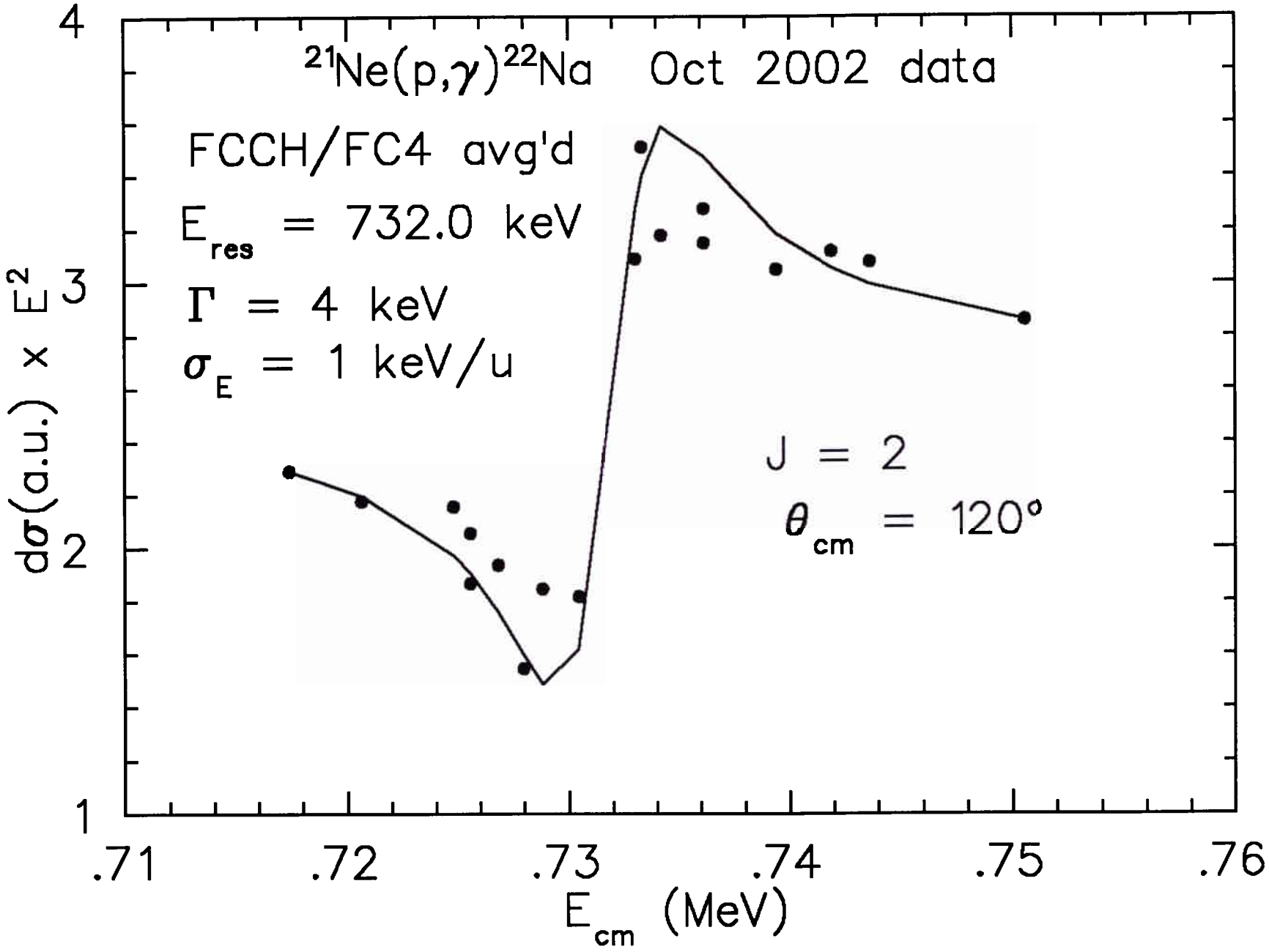


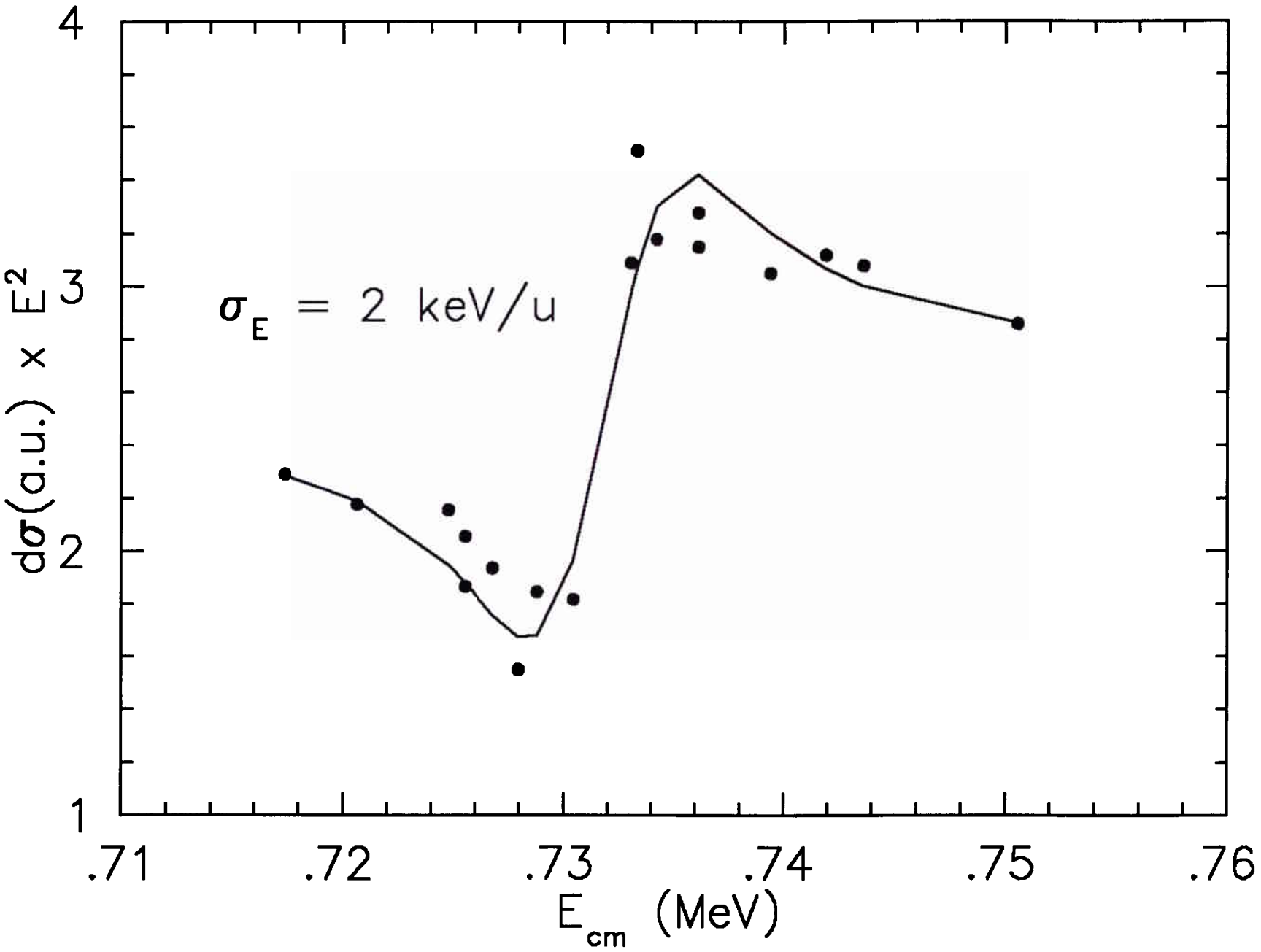
cH−Energy (Mask=21)



cH−Front−strip (Mask=25)


^{21}Ne(p,γ)^{22}Na
Oct 2002 data
GTOF2_NS
2400
2380
2360
2340
2320
750
760
770
780
790
Beam energy (keV/u)


$^{21}Ne(p,\gamma)^{22}Na$ Oct 2002 data
FCCH/FC4 avg'd
E_{res} = 732.0 keV
Γ = 4 keV
σ_E = 1 keV/u
J = 2
θ_{cm} = 120°
$d\sigma$(a.u.) x E^2
E_{cm} (MeV)
4
3
2
1
.71
.72
.73
.74
.75
.76


4
3
2
1
dσ(a.u.) x E²
σ_E = 2 keV/u
.71
.72
.73
.74
.75
.76
E_cm (MeV)

to be able to extract a value for the resonance strength for this state.

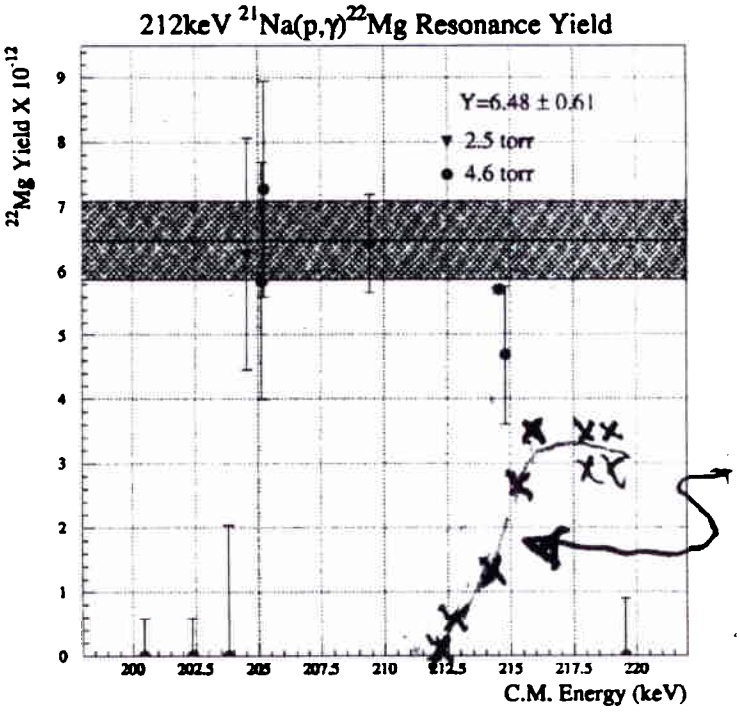


FIGURE 3. Yield curve for the E_{cm} = 212 keV resonance (preliminary). The hatched band shows one standard deviation about the mean of the measured thick target yield. The extreme points show our limits for off-resonance background or direct capture yields.

A preliminary thick-target yield curve for the E_{cm} = 212 keV resonance is shown in Figure 3. The measured yield is plotted as the number of observed ^{22}Mg recoils per 10^{12} beam ions, and includes corrections for gamma detection efficiency and the selected charge state fraction of the recoil. Two different measurements were taken at the same energy as a consistency check. Additionally, a measurement was taken with a different gas target pressure, also to verify consistency. A typical data point in the plateau

by over 7 keV. Efforts
results are in progress. Furtl
resonances of interest at h
performed or are presentl
particular, a significant yiel
energies around 560 keV/u.
known resonance at E_{cm}
measurements and analy
^{21}Na(p,γ)^{22}Mg reaction rate
be calculated. The impact
nucleosynthesis and energy
investigated.

CONCL

First measurements witl
the DRAGON facility at IS
The ^{21}Na(p,γ)^{22}Mg reaction
NeNa cycles in novae, has
resonances at E_{cm} = 212
curves for both resonances
on other resonances are
Future studies at DRAGON
in the Hot-CNO cycles,
cycles. In particular, the n
are direct studies of th
^{13}N(p,γ)^{14}O reactions, impo
the Hot-CNO cycles and CN

ACKNOWLE

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producing and delivering