

ISAC Science Forum, 2004-04-14

PRESENT:

Friedhelm Ames, Andrei Andreyev, Gordon Ball, Rick Baartman (RB), John Behr, Pierre Bricault (PB), Lothar Buchmann (LB), Barry Davids, Paul Delheij, Jens Dilling, Marik Dombisky (MD), Greg Hackman (GH), Andrew Hurst, Dave Hutcheon, Jens Lassen, Phil Levy, Matt Lindroos, Kei Minasomino, Colin Morton, Jean-Michel Poutissou, S.C. Ravuri, Zaher Salman (ZS), Paul Schmor, Alan Shotter, Martin Smith, Mike Trinczek, Pat Walden

Notes transcribed by GH

Reports on Prior Beam times

E909: Greg Hackman

GH reported that the ^{26}Na lifetime data taken provided important information for disentangling multi-detector and single-detector random coincidence effects in the lifetimes measured by gamma-ray yield. These effects are strongly dependent on amplifier shaping times and the initial just-offline analysis pointed to 1 μs as an optimal tradeoff between randoms and energy resolution. Throughout the data collection beam quality was good.

βNMR : Zaher Salman

Despite “not being prepared”, ZS showed that the βNMR setup can be used to do depth profiling of magnetic field distributions near the surface in the vortex state in type II superconductors. The first weekend of running was of limited use because of an unstable and low-transmission tune that the experimenters were left with on Friday evening, which was corrected only on Monday morning when RB retuned the beam. Throughout the run the previously mentioned beam glitches still persisted, and while the βNMR group had developed offline data analysis techniques for working around these beam spot fluctuations, it was still hampering their efforts and limiting data collection.. Furthermore, yield measurements interrupting beam periods were a problem; resuming the experiment after a yield measurement costs $\frac{1}{2}$ to one full shift.

In ongoing discussions during the presentation, MD mentioned that he only had 60% transmission of separated beam to the yield station, and was seeing large build-ups of long-lived isomers on upstream slits that were confounding his yield measurements; PB pointed out that there was a desperate need for good low-current diagnostics; and there were concerns raised regarding recovery of ISAC beams following cyclotron maintenance.

E952, $^{12}\text{C}(^4\text{He},\gamma)^{16}\text{O}$ with DRAGON: Lothar Buchmann

LB reported that DRAGON was being “exercised” to establish recoil transport acceptance parameters. Electric dipole conditioning was limiting them to measuring the 2+ resonance. LB reported problems with restarting the off-line ion source, in some cases taking up to 8 hours. AH countered that the operations group did an outstanding job.

Report on Upcoming Experiments

High-K Isomers: S.C. Ravuri

RSC summarized physics case for studying high-K isomers in A~170 nuclei. He summarized the results of the August 2003 8π experiments, which included the surprising evidence that a 3.1 ms isomer was populated in the source, transported to the 8π , and observed. RSC also summarized some of the yet unexplained results from that previous run, and the run plan for clarifying those issues and surveying other potential A~170 high-K isomer candidates. Good vacuum in the beamlines is critical to avoid loss of long-lived “contaminant” beams. In the ensuing discussion PB reported that ^{181}Ta would be used as a pilot beam for tuning; although this would not provide enough current for an emittance scan, it was the only appropriate option since the alpha and beta coil settings cannot be extrapolated over a large mass range (e.g from ^{39}K).

^{18}Ne Half-Life – Martin Smith

MBS summarized the physics case for a precision half-life measurement of ^{18}Ne , and pointed out that $10^4/\text{s}$ would be enough for the experiment. MBS reported that preparations for the experiment were continuing with no major hitches at that point. GCB followed up by mentioning that for a good decay spectrum you really wanted typically 100,000 decays per sample and for a good lifetime measurement you needed about 5 million decays total.

In ensuing discussion, MD reminded the audience that nitrogen ions or hydride molecular ions would be ionized in this source. MBS and GCB were to investigate how $^{18}\text{N}^+$, $^{17}\text{NH}^+$, and $^{16}\text{NH}_2^+$ would affect the measurement.

AGENDA ITEMS PROPOSED FOR NEXT MEETING, 2004-04-14:

- Report on previous and upcoming experiments (ongoing)
- ^{11}C tests
- June and July beam schedule, with emphasis on target scheduling