

HRIBF Highlight FY 2007: HRIBF Operations and Development

Holifield Radioactive Ion Beam Facility (HRIBF) operations are off to an excellent start in FY2007, The facility has been operated aggressively in anticipation of the favorable funding in the President’s Budget Request. From October through the first week in December, when a scheduled maintenance shutdown began, we provided over 700 hours of RIB to experiments out of 1115 total research hours. For the most part, these were very difficult beams, including a very rewarding series of decay spectroscopic studies on short-lived Cu and Ga isotopes using post-accelerated beams of $^{76-79}\text{Cu}$ and $^{83-85}\text{Ga}$. The longest-lived of these isotopes has a half-life of 0.65 seconds, and $^{84,85}\text{Ga}$ have half-lives less than 100 ms. This is a major achievement for the HRIBF Isotope Separator On-Line (ISOL) development group. It is worth noting that in the last six months before the December shut down, HRIBF delivered 1500 h of RIB to experiments. The tandem tank opening, which is the major element of the shutdown, is proceeding according to schedule. Prior to the shutdown, the tandem set a record for continuous operation without major maintenance. The availability of the High Power Target Laboratory (HPTL) has provided added flexibility to schedule full-power ISOL development work during the tandem shutdown. After the shutdown is complete in mid February, and budget permitting, one week of stable beam delivery at low terminal voltage is planned, followed by a six-week neutron-rich RIB campaign. At this point, HRIBF operations will cease if funding remains at FY2006 levels. If more favorable funding develops, a radioactive fluorine campaign will be staged followed by another neutron-rich campaign (~8 weeks each), with stable beam runs used to fill time for RIB target ion source changeovers, etc.

Isotope	$T_{1/2}$ (s)	Main Results
^{76}Cu	0.65	βn -branching ratio $I_{\beta n}$
^{77}Cu	0.46	$I_{\beta n}$, ν - levels in $N=47$ ^{77}Zn
^{78}Cu	0.35	$I_{\beta n}$, I^{π} of $^{78}\text{Cu}_{49}$ revised
^{79}Cu	0.19	$\beta n\gamma$ decay observed first time
^{83}Ga	0.30	$\beta n\gamma, \beta\gamma, \nu s_{1/2}$ in $N=51$ ^{83}Ge
^{84}Ga	0.08	2^+ in $N=52$ ^{84}Ge , $\nu s_{1/2}$ in ^{83}Ge
^{85}Ga	~0.07	rate of 0.1pps

Figure 1. “Towards ^{78}Ni ”: “ β -decay Experiments with Post-Accelerated (3 MeV/u) Pure Neutron-Rich RIBs,” Jeff Winger *et al.*, RIB-108 and 122