Nsrl2 Schedule and Parameters

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Caution! The following schedule is subject to change. Please note release date above.

NSRL is to begin taking beam on Monday March 15, 2004.

Beam Order:

1. Silicon. 600 MeV per nucleon. March 15–19.
2. Carbon. 300 MeV per nucleon. March 22–23.
3. Iron. 1000 MeV per nucleon. March 26–April 9.
4. Iron. 600 MeV per nucleon. April 12–April 19.
5. Titanium. 1050 MeV per nucleon. April 20–22.

Ions for NSRL are to be delivered from MP6 during the day. Booster User 3 is to be used for NSRL operation.

Silicon (Si^{9+}) and Carbon (C^{5+}) are to be injected into Booster at the same rigidity as Gold (Au^{32+}). This will allow for ppm operation of RHIC and NSRL.

Iron and Titanium will be injected into Booster at same rigidity as last NSRL run.

1 Injection and Extraction Parameters

The following tables list the parameters for various ions at Booster injection and extraction.

Table 1: Predicted Au, C, and Si Parameters at Booster Injection

Parameter	Au^{32+}	C^{5+}	Si^{9+}	Unit
mc^2	183.456812	11.17537316	26.05574058	GeV
11DH1 NMR Probe	5580	5580	5580	Gauss
hf	397.607	507.130	392.545	kHz
h	6	3	3	
$T = 1/f$	15.0903	5.9156	7.6424	μs
Kinetic Energy W	182.7568	73.0440	101.6387	MeV
$B\rho$	0.8538	0.8538	0.8538	Tm
$B\rho/\rho$	615.769	615.769	615.769	Gauss
Inflector Predicted	22.203	56.638	43.841	kV

Table 2: Gold, Carbon, and Silicon Parameters at Booster Injection

Parameter	Au^{32+}	C^{5+}	Si^{9+}	Unit
mc^2	183.456812	11.17537316	26.05574058	GeV
Date	15 Mar 04	22 Mar 04	15 Mar 04	
11DH1 NMR Probe	5580	5580	5580	Gauss
hf	397.080	507.130	392.545	kHz
h	6	3	3	
$T = 1/f$	15.1103	5.9156	7.6424	μs
Kinetic Energy W	182.2716	73.0440	101.6387	MeV
$B\rho$	0.85266535	0.8538	0.8538	Tm
$B\rho/\rho$	614.950	615.769	615.769	Gauss
Booster Hall Probe	5960	5858	5858	Counts
Booster Gauss Clock	150	252	252	Counts
"Injection Field"	611.0	611.0	611.0	Gauss
Inflector Setpoint	21.975	56.291	43.757	kV
Inflector Predicted	22.144	56.638	43.841	kV

Table 3: Iron Parameters at Booster Injection. The damaged inflector septum was replaced in October 2003.

Parameter	Fe^{20+}	Fe^{20+}	Fe^{20+}	Unit
mc^2	52.0928437	52.0928437	52.0928437	GeV
Date	2 June 03	5 Nov 03	7 Apr 04	
11DH1 NMR Probe	4364.1	4364.1	4364.1	Gauss
hf	341.15(10)	341.100	341.100	kHz
h	3	3	3	
$T = 1/f$	8.7938	8.7951	8.7951	μs
Kinetic Energy W	153.258446	153.213327	153.213327	MeV
$B\rho$	0.666936878	0.666838554	0.666838554	Tm
$B\rho/\rho$	481.001	480.930	480.930	Gauss
Booster Hall Probe	451.2	451.4	581.3	Gauss
Booster Gauss Clock	25.2	25.5	-108.2	Gauss
Injection Field H	476.4	476.9	473.1	Gauss
Inflector Setpoint V_S	30.079	29.534	29.429	kV
Calculated Voltage V_I	29.762	29.753	29.753	kV

Table 4: Titanium Parameters at Booster Injection. The damaged inflector septum was replaced in October 2003.

Parameter	Ti^{18+}	Ti^{18+}	Ti^{18+}	Unit
mc^2	44.6540277	44.6540277	44.6540277	GeV
Date	24 June 03	13 Nov 03	20 Apr 04	
11DH1 NMR Probe	4364.1	4364.1	4364.1	Gauss
hf	358.45(10)	358.452	358.242	kHz
h	3	3	3	
$T = 1/f$	8.3694	8.3693	8.3742	μs
Kinetic Energy W	145.101856	145.103483	144.932686	MeV
$B\rho$	0.667638100	0.667641849	0.6672481655	Tm
$B\rho/\rho$	481.507	481.510	481.2256	Gauss
Booster Hall Probe	451.2	451.8	581.2	Gauss
Booster Gauss Clock	25.2	25.2	-108.0	Gauss
Injection Field H	476.4	477.0	473.2	Gauss
Inflector Setpoint V_S	31.556	30.835	30.941	kV
Calculated Voltage V_I	31.304	31.305	31.268	kV

Table 5: Carbon and Silicon Parameters at Booster Extraction

Parameter	C^{5+}	C^{5+}	Si^{9+}	Unit
mc^2	11.17537316	11.17537316	26.05574058	GeV
Date	20 Nov 03	22 Mar 04	12 Mar 04	
hf	2.9154	2.91717	3.54030	MHz
h	3	3	3	
$T = 1/f$	1.02902	1.02839	0.84739	μs
Kinetic E per Nucleon	299.8868	300.4462	601.1123	MeV
$B\rho$	6.4467691	6.45361431	12.62517797	Tm
$B\rho/\rho$	4649.47	4654.41	9105.40	Gauss
Magnetic Field Setpoint	4751	4751	9239	Gauss
Calculated MM Current	1913	1915	3747	Amps
MM Current Setpoint	1954	1954	3819	Amps

Table 6: Iron Parameters at Extraction

Parameter	Fe^{20+}	Fe^{20+}	Fe^{20+}	Unit
mc^2	52.0928437	52.0928437	52.0928437	GeV
Date	21 Oct 03	22 Oct 03	29 Oct 03	
hf	3.90762	3.90842	3.9076250	MHz
h	3	3	3	
$T = 1/f$	0.76773	0.76757	0.76773	μs
Kinetic E per Nucleon	1003.5312	1004.8476	1003.5394	MeV
$B\rho$	15.83392219	15.84794499	15.83400974	Tm
$B\rho/\rho$	11419.57	11429.69	11419.64	Gauss
Magnetic Field Setpoint	11600	11600	11600	Gauss
Calculated MM Current	4699	4704	4699	Amps
MM Current Setpoint	4934	4934	4934	Amps

Table 7: Iron Parameters at Extraction

Parameter	Fe^{20+}	Fe^{20+}	Fe^{20+}	Unit
mc^2	52.0928437	52.0928437	52.0928437	GeV
Date	27 Oct 03	29 Oct 03	31 Oct 03	
hf	3.7545	3.9076250	3.9077(1)	MHz
h	3	3	3	
$T = 1/f$	0.79904	0.76773	0.76772	μs
Kinetic E per Nucleon	795.7931	1003.5394	1003.6627	MeV
$B\rho$	13.57913314	15.83400974	15.83532318	Tm
$B\rho/\rho$	9793.40	11419.64	11420.58	Gauss
Magnetic Field Setpoint	9981	11600	11600	Gauss
Calculated MM Current	4030	4669	4700	Amps
MM Current Setpoint	4139	4934	4934	Amps

Table 8: Titanium Parameters at Extraction

Parameter	Ti^{18+}	Ti^{18+}	Ti^{18+}	Unit
mc^2	44.6540277	44.6540277	44.6540277	GeV
Date	23 June 03	13 Nov 03	18 Nov 03	
hf	3.91144(60)	3.9105	3.9103	MHz
h	3	3	3	
$T = 1/f$	0.76698	0.76717	0.76720	μs
Kinetic E per Nucleon	1009.9121	1008.3523	1008.0210	MeV
$B\rho$	15.14496712	15.12915494	15.12579556	Tm
$B\rho/\rho$	10922.69	10911.29	10908.86	Gauss
Magnetic Field Setpoint	11100	11100	11100	Gauss
Calculated MM Current	4495	4490	4489	Amps
MM Current Setpoint	4663	4663	4663	Amps

Table 9: Iron and Titanium Parameters at Extraction

Parameter	Fe^{20+}	Fe^{20+}	Ti^{18+}	Unit
mc^2	52.0928437	52.0928437	44.6540277	GeV
Date	28 Mar 04	12 Apr 04	20 Apr 04	
hf	3.907680	3.55888	3.93382	MHz
h	3	3	3	
$T = 1/f$	0.76772	0.84296	0.76262	μs
Kinetic E per Nucleon	1003.6298	614.8564	1048.3147	MeV
$B\rho$	15.83497291	11.52230630	15.53310227	Tm
$B\rho/\rho$	11420.33	8309.99	11202.62	Gauss
Magnetic Field Setpoint	11600	8471	11387	Gauss
Calculated MM Current	4700	3420	4610	Amps
MM Current Setpoint	4934	3495	4815	Amps