Summary of the FRS settings in S412

Matter in the FRS common to all settings:

- S0
  - SIS vacuum window – 5 μm Ti
  - SEETRAM – 3x10 μm Ti
- S2
  - Degrader – 2200 mg/cm^2 Al, 3mrad
  - Vacuum exit window – 100 μm Fe
  - Finger detector – 1 mm plastic scintillator and 2x50 μm Fe pocket windows
  - 2 TPC detectors – 7.52 mg/cm^2 kapton, 11.5 cm Ar, 3.75 mg/cm^2 kapton, each detector
  - 120 cm air
  - Vacuum entrance window – 200 μm Ti
- S8
  - 1 mm plastic scintillator

Bρ values given below are calculated with MOCADI. Input files are available at /u/kelic/mocadi/s412.
Target station 2 has been used in all settings.

Settings with ^{136}Xe primary beam

Setting @ CC energy / *A*MeV	SIS energy / *A*MeV	Additional matter		Slits / mm			Bρ / Tm				Setting name	Page in FRS logbook
		S0	S1	S1	S2	S8	TA-S1	S1-S2	S2-S8	S8-CC		
136Xe @ 562	862	2511 mg/cm^2 Be	2x50 μm Fe + 4.9 mm Al	-15, 15	open	open	11.80318	11.19169	9.874638	9.811484	S412_16	71
124Sn @ 577	862	2511 mg/cm^2 Be	2x50 μm Fe + 4.9 mm Al	-10, 10	-50, 50	-25, 15	11.64374	11.08105	9.877489	9.81949	S412_19	78
128Sn @ 570	862	4013 mg/cm^2 Be + 223 mg/cm^2 Nb	-	-20, 9	-70, 70	-30, 15	11.32245	11.32245	10.10909	10.05067	S412_21	84

136Xe @ 331	670	2511 mg/cm^2 Be	2x50 µm Fe + 4.9 mm Al	-30, 30			9.709853	8.974997	7.245889	7.154175	S412_24	100
124Sn @ 349	670	2511 mg/cm^2 Be	2x50 µm Fe + 4.9 mm Al	-7, 10	-10, 40	-40, 40	9.58945	8.91470	7.3530	7.27076	S412_25	104
128Sn @ 359	670	2511 mg/cm^2 Be	2x50 µm Fe + 4.9 mm Al	-30, 30	-70, 75	open	9.922588	9.25102	7.707647	7.625681	S412_26	109
131Sn @ 508	800	4013 mg/cm^2 Be + 223 mg/cm^2 Nb	-	-35, 35	open	-40, 40	10.8985	10.8985	9.60803	9.589143	S412_27	116
*126Sn @ 566	862	4013 mg/cm^2 Be + 223 mg/cm^2 Nb	-	-20, 0	-25, 55	-25, 25	11.12867	11.12867	9.912498	9.8540	S412_28	120

* Setting not used; spill length not shorter than 5 s not to cause BIO-Rem alarm.

Settings with ^{238}U primary beam

Setting @ CC energy / *A*MeV	SIS energy / *A*MeV	Additional matter		Slits / mm			Bρ / Tm				Setting name	Page in FRS logbook
		S0	S1	S1	S2	S8	TA-S1	S1-S2	S2-S8	S8-CC		
131Sn @ 562	700	2511 mg/cm^2 Be	-	open	open	open	10.8985	10.8985	9.60803	9.58914	S412_29	133
134Sn @ 577	700	2511 mg/cm^2 Be	-	-40, 40	open	-40, 40	11.12766	11.12766	9.84128	9.77199	S412_30	137

Additional information

- Effective radii (see page 101)
  - ρ_1 = 11.18196 m
  - ρ_2 = 11.28448 m
  - ρ_3 = 11.34475 m
  - ρ_4 = 11.24517 m

- Dispersion
  - TA – S1: 2200 mm
  - TA – S2: -6474 mm
  - S1 – S2: -3500 mm
  - S2 – S3: -3600 mm
  - S2 – S8: 11000 mm (see page 47)
  - S3 – S8: 3906 mm

- Transmission
  - For 136Xe setting (S412_16), S8 – CC: MOCADI → 45 %, experiment → 28 % (see page 50); similar for 124Sn setting (S412_19).
  - For 134Sn setting (S412_30), TA – CC, for 1.E+9 238U/spill: MOCADI → ~900 counts on POS, experiment: ~ 200 counts on POS.

- Primary-beam intensities
  - 136Xe : ~1.E+9 / spill (not more than 2.0E+9 / spill)
  - 238U: ~1.E+9 / spill (not more than 1.5E+9 / spill)