ARIS configurations update

v.16.11.13
01/22/23

Shane Watters' project : ARIS optics optimization based on LISE extended configurations

Marc and Kei's contributions is much appreciated

ARIS configuration files

Documents\LISEcute\files\examples\FRIB\ARIS*.*

Name	Ext	Size	Date
[..]		<DIR>	09/14/2022
c_PSv15_k1_CB1	lpp	461,110	12/12/2022
c_PSv15_k1_CB2	lpp	461,362	12/12/2022
c_PSv15_k1_CB2_fission	lpp	720,715	01/21/2023
c_PSv15_k3	lpp	241,590	11/01/2022
c_PSv15_k3_CB1	lpp	461,775	12/12/2022
c_PSv15_k3_CB2	lpp	462,023	12/12/2022
c_PSv15_k3_CB2_fission	lpp	726,111	12/12/2022
c_PSv15_k3_CB2_N4N	lpp	691,229	12/12/2022
e_PSv15_k3CB2_COSY	lpp	2,272,423	01/21/2023
e_PSv15_k3CB2_LISE	lpp	2,145,009	01/21/2023

extended

ARIS quad calibration files

LISEcute\calibrations\FRIB*.*

Name	Ext
[..]	
FSQ1_2020_n2	cal
FSQ10_S1_202207_n2	cal
FSQ2_S2_2020_n2	cal
FSQ5_S1_2020_n2	cal
FSQ5_S3_n2	cal
FSQ7_S1_202103_n2	cal
FSQ7_S2_202103_n2	cal
FSQ7_S3_202012_n2	cal
FSQ7_S4_202012_n2	cal
FSQ7_S5_202009_n2	cal
FSQ7_S6_2021_n2	cal
FSQ8_S1_202103_n2	cal
FSQ8_S2_202009_n2	cal
FSQ8_S3_202012_n2	cal
FSQ9_S1_202207_n2	cal
FSQ9_S2_202207_n2	cal

Extended files

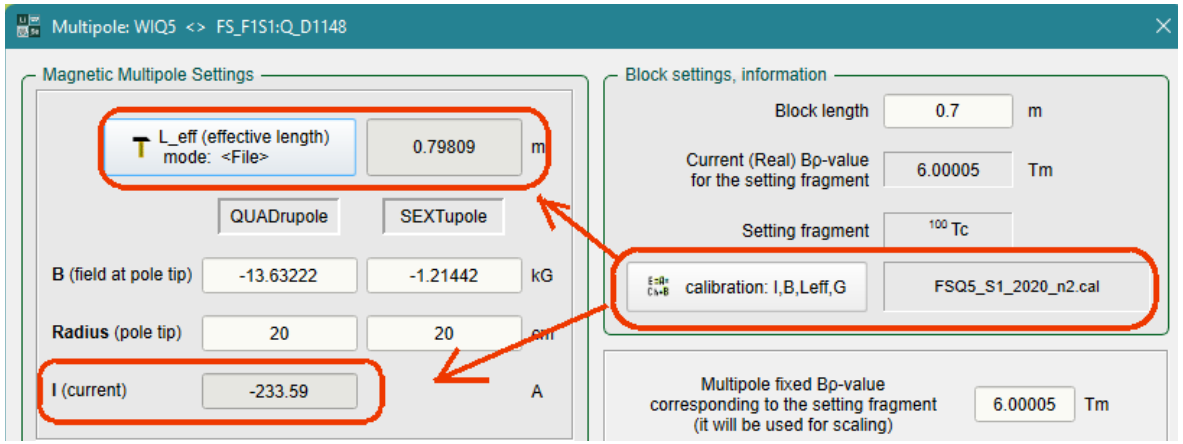
Still under construction by Shane

Implementation of official names

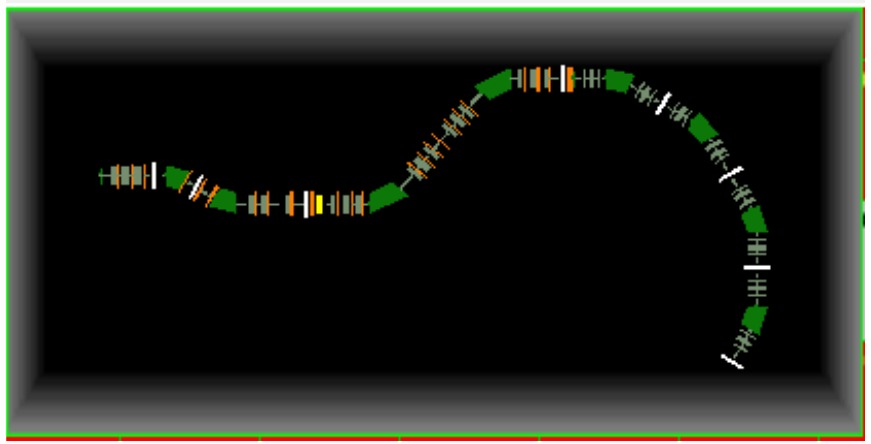
Spectrometer design

Block	Nickname	Official	Z-q	Length, m	Enable
drift	toL1088			0.526	✓
drift	FSS2_space			0.4	✓
Fit	D2i_sY			0	✓
drift	L1096			0.4	✓
** Dipole	FSD1_SCD2	FS_F1S1:DV_D1108	0	2.094	✓
drift	L1133			1.449	✓
<Quad>	WIQ4	FS_F1S1:Q_D1137		0.7	✓
Fit	Q4_sR			0	✓
drift	L1142			0.388	✓
<Quad>	WIQ5	FS_F1S1:Q_D1148		0.7	✓
Fit	Q5_sR			0	✓
drift	L1153			0.387	✓
drift	FSQ6_space			0.7	✓
drift	L1164			0.5	✓
<Quad>	WIQ7	FS_F1S1:Q_D1170		0.7	✓
Fit	Q6_sR			0	✓
drift	toVD1			0.929	✓
drift	PSW_VD1			0.051	✓
drift	PSW_SLV			0.025	✓
drift	L1184			0.013	✓
slits	slits_PS_WED			0	✓
Fit	MinX_Q67			0	✓

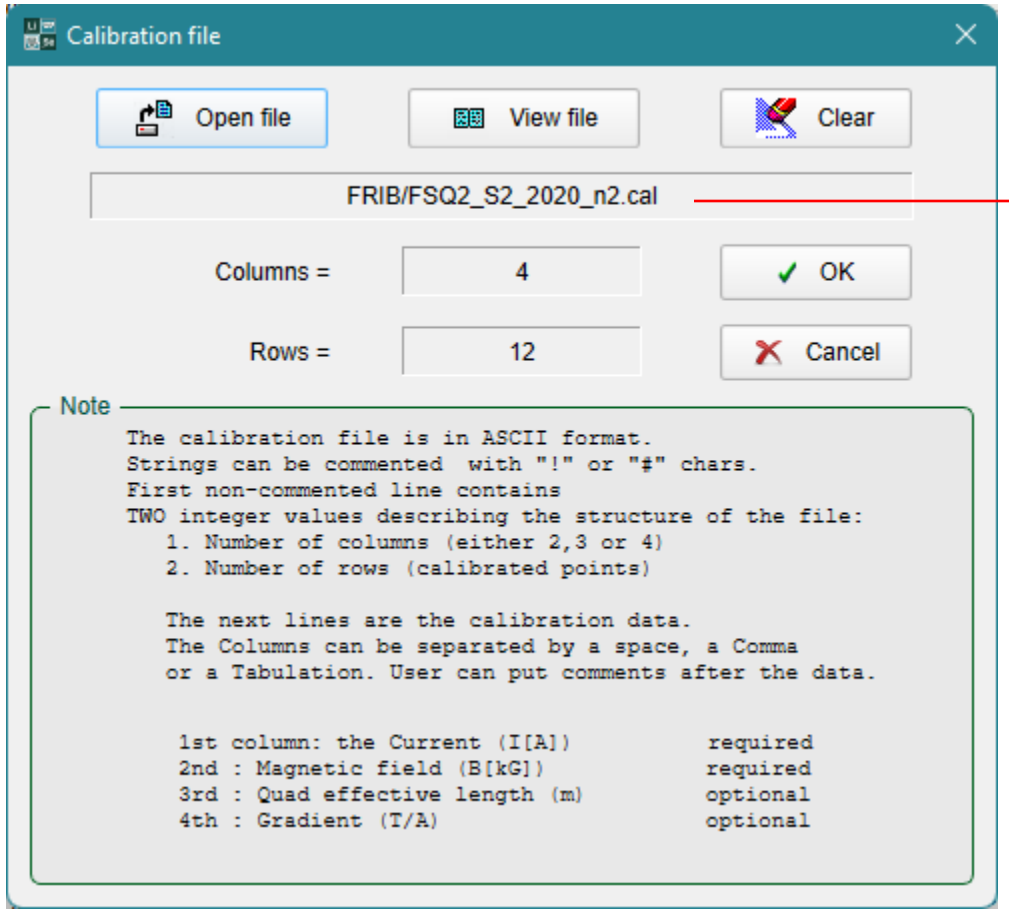
Using calibration files in Quads



Fitting constraints for optimization (e_PSv15_k3CB2_LISE.lpp)



Quad calibration files



Documents\LISEcute\calibrations\FRIB\FSQ2_S2_2020_n2.cal]

File Edit Options Encoding Help

```
! i2 [A]          B2(R0)[kG]       L2[m]            g2[T/m]
4 12
0                 0                0.826892         0
10.010294         0.51059          0.826892         0.392763
35.004654         1.76528          0.82251          1.357907
70.006986         3.52461          0.821737         2.711237
105.017857        5.28681          0.820785         4.06678
140.021365        7.04512          0.819424         5.419322
175.015636        8.797            0.81659          6.766924
210.027429        10.54268         0.811704         8.109754
245.028561        12.23944         0.805383         9.414958
280.024244        13.82999         0.797991         10.638458
315.026136        15.15347         0.796169         11.656517
350.024586        16.3369          0.796176         12.566847

# multipole parameters fitted to field data
#  0.2 m pole-tip radius          0.13 m warm-bore radius
M5_PARAM_TABLE_V01
0.13      [m] Reference radius to use with coefficients.
0.68      [m] Yoke length
2         IMP order of multipole
2         IMP_REF multipole for effective length of M5
0         oper. lower limit (field gradient)
12.566847         oper. upper limit (field gradient)
```

Extended configuration settings for “LISE” and “COSY” modes

		LISE	COSY
	Fitting constraint block	yes	no
	Dispersive blocks: link to COSY map	yes (temporary)	yes
QUAD block	Show in the "Setup" window	(2) B(field)	-
	link to COSY maps	no	yes
	Fitting constraints	yes	no
	calibration files	yes	yes
	L_eff (effective length) mode	3 (calibration file)	0 (equal to block length)
	Calculate 2nd order	yes	-
	Allow remote matrices recalcultation	yes	-
	Use in Fitting constraints	yes	no
	Use bound constraints	yes	no
	Low bound	-20	
	Upper bound	+20	

manual settings in file for the LISE case

```
{============================ BLOCK S6 - Drift ====================================}

[S6_General]
                Name = WIQ1,1                                ; Name of Block, Constant name 1/0
            Official = FS_F1S1:Q_D1013
           Available = 1
              Length = 0.8255                 m              ; Length block for optical blocks
           SE_method = 1                                     ; 0: S-block, 1: E-block
         SecondOrder = 1                                     ; Exist - 1, Non - 0
          ThirdOrder = 0                                     ; Number of lines
       CalculateAuto = 1                                     ; 0/1/2  nothing, keep_matrix, keep_field
    RemotePermission = 1
           B-fitting = 1 0 -100.000 100.000                  ; B-field: Use, Gate, Bounds

[S6_DriftSettings]
                Mode = 2                                     ; 4-finger, E-Quad 3, M-Quad 2, Stand 1, Beamline 0
          ShowLength = 0                                     ; I 3 / B 2 / Brho 1 / Length 0
           Leff_mode = 0                                     ; file-3, calc-2, manually-1, keep-0
           Leff_coef = 0.7                1
         Leff_manual = 0                  m                 ; for mode=1
      MagneticField = 7.31695             KG
             Radius = 10.4                cm                ; pole tip
    Include 2nd order = 1
       CorrespondBrho = 6.00005           Tm                ; refBrho
       CorrespondErho = 2.79261e+4
            Voltage = 0                   kV                ; for e-quad
         sextMagnField = 0                KG
             sextRad = 10.4               cm                ; pole tip
  Calibration file = FRIB/FSQ1_2020_n2.cal
```

do not change a quad Radius (pole tip) . Keep how it was in original LISE(COSY) file

Make notes if it is different from the lattice