Steps for MOLLER Magnetic Field Study

February 12, 2024

- ☐ Generate root files - see table below. [1-3 days]
    a. Symmetric: ideal field with perfect symmetry.
    b. DipolePoint5Same: asymmetric field with coils offset by 0.5mm in the same direction.
    c. DipolePoint5Rand: asymmetric field with coils offset by 0.5mm in random directions.
    d. Dipole3Rand: asymmetric field with coils offset by 3mm in random directions.
- ☐ Set up a separate repository for scripts. Make sure that this can be used on a local computer, not on the JLab computing farm. [2-3 days]
- ☐ Redo study from last year with updated sieve geometry. [1-2 days]
- ☐ Use ellipses on 2D plots instead of analyzing 1D plots. [2-3 days]
- ☐ What variables are most affected by asymmetries in the magnetic field? [2-3 days]
    a. r vs. phi
    b. r vs. r'
    c. phi vs. phi'
- ☐ Vassu has a method of excluding radiative effects. How do the magnetic field study results look if we use this method? [2-3 days]
- ☐ Is there a specific beam energy in which we are able to see the best results?
    a. Pass-2 C12
    b. Pass-3 C12
    c. Pass-5 LH2
- ☐ Is there a specific target location/type for which we are able to see the best results?
    a. Upstream C12 foil
    b. Middle C12 foil
    c. Downstream C12 foil
    d. LH2

Field Map	Beam Energy [GeV]	Target	Generator	Beam Current [uA]	Sieve Rotation [deg]	Number of Events	Root File Name
Symmetric	4.4	DS C12	eC12	1	0	1M	
Symmetric	6.6	DS C12	eC12	1	0	1M	
Symmetric	11	LH2	Moller	1	0		
DipolePoint5Same	4.4	DS C12	eC12	1	0	1M	
DipolePoint5Same	4.4	DS C12	eC12	1	+(360/7)	1M	
DipolePoint5Same	4.4	DS C12	eC12	1	+2(360/7)	1M	
DipolePoint5Same	4.4	DS C12	eC12	1	+3(360/7)	1M	
DipolePoint5Same	4.4	DS C12	eC12	1	+4(360/7)	1M	
DipolePoint5Same	4.4	DS C12	eC12	1	+5(360/7)	1M	
DipolePoint5Same	4.4	DS C12	eC12	1	+6(360/7)	1M	
DipolePoint5Same	6.6	DS C12	eC12	1	0	1M	
DipolePoint5Same	6.6	DS C12	eC12	1	+(360/7)	1M	
DipolePoint5Same	6.6	DS C12	eC12	1	+2(360/7)	1M	
DipolePoint5Same	6.6	DS C12	eC12	1	+3(360/7)	1M	
DipolePoint5Same	6.6	DS C12	eC12	1	+4(360/7)	1M	
DipolePoint5Same	6.6	DS C12	eC12	1	+5(360/7)	1M	
DipolePoint5Same	6.6	DS C12	eC12	1	+6(360/7)	1M	
DipolePoin	11	LH2	Moller	1	0		

t5Same							
DipolePoint5Same	11	LH2	Moller	1	+(360/7)		
DipolePoint5Same	11	LH2	Moller	1	+2(360/7)		
DipolePoint5Same	11	LH2	Moller	1	+3(360/7)		
DipolePoint5Same	11	LH2	Moller	1	+4(360/7)		
DipolePoint5Same	11	LH2	Moller	1	+5(360/7)		
DipolePoint5Same	11	LH2	Moller	1	+6(360/7)		
DipolePoint5Rand	4.4	DS C12	eC12	1	0	1M	
DipolePoint5Rand	4.4	DS C12	eC12	1	+(360/7)	1M	
DipolePoint5Rand	4.4	DS C12	eC12	1	+2(360/7)	1M	
DipolePoint5Rand	4.4	DS C12	eC12	1	+3(360/7)	1M	
DipolePoint5Rand	4.4	DS C12	eC12	1	+4(360/7)	1M	
DipolePoint5Rand	4.4	DS C12	eC12	1	+5(360/7)	1M	
DipolePoint5Rand	4.4	DS C12	eC12	1	+6(360/7)	1M	
DipolePoint5Rand	6.6	DS C12	eC12	1	0	1M	
DipolePoint5Rand	6.6	DS C12	eC12	1	+(360/7)	1M	
DipolePoin	6.6	DS C12	eC12	1	+2(360/7)	1M	

t5Rand							
DipolePoint5Rand	6.6	DS C12	eC12	1	+3(360/7)	1M	
DipolePoint5Rand	6.6	DS C12	eC12	1	+4(360/7)	1M	
DipolePoint5Rand	6.6	DS C12	eC12	1	+5(360/7)	1M	
DipolePoint5Rand	6.6	DS C12	eC12	1	+6(360/7)	1M	
DipolePoint5Rand	11	LH2	Moller	1	0		
DipolePoint5Rand	11	LH2	Moller	1	+(360/7)		
DipolePoint5Rand	11	LH2	Moller	1	+2(360/7)		
DipolePoint5Rand	11	LH2	Moller	1	+3(360/7)		
DipolePoint5Rand	11	LH2	Moller	1	+4(360/7)		
DipolePoint5Rand	11	LH2	Moller	1	+5(360/7)		
DipolePoint5Rand	11	LH2	Moller	1	+6(360/7)		
Dipole3Rand	4.4	DS C12	eC12	1	0	1M	
Dipole3Rand	4.4	DS C12	eC12	1	+(360/7)	1M	
Dipole3Rand	4.4	DS C12	eC12	1	+2(360/7)	1M	
Dipole3Rand	4.4	DS C12	eC12	1	+3(360/7)	1M	
Dipole3Ra	4.4	DS C12	eC12	1	+4(360/7)	1M	

nd							
Dipole3Rand	4.4	DS C12	eC12	1	+5(360/7)	1M	
Dipole3Rand	4.4	DS C12	eC12	1	+6(360/7)	1M	
Dipole3Rand	6.6	DS C12	eC12	1	0	1M	
Dipole3Rand	6.6	DS C12	eC12	1	+(360/7)	1M	
Dipole3Rand	6.6	DS C12	eC12	1	+2(360/7)	1M	
Dipole3Rand	6.6	DS C12	eC12	1	+3(360/7)	1M	
Dipole3Rand	6.6	DS C12	eC12	1	+4(360/7)	1M	
Dipole3Rand	6.6	DS C12	eC12	1	+5(360/7)	1M	
Dipole3Rand	6.6	DS C12	eC12	1	+6(360/7)	1M	
Dipole3Rand	11	LH2	Moller	1	0		
Dipole3Rand	11	LH2	Moller	1	+(360/7)		
Dipole3Rand	11	LH2	Moller	1	+2(360/7)		
Dipole3Rand	11	LH2	Moller	1	+3(360/7)		
Dipole3Rand	11	LH2	Moller	1	+4(360/7)		
Dipole3Rand	11	LH2	Moller	1	+5(360/7)		
Dipole3Ra	11	LH2	Moller	1	+6(360/7)		

nd							