

Polarimetry

8-24-2015

n³He Experiment

Data Runs

<i>Item</i>	<i>FGV</i>	<i>By1</i>	<i>By2</i>	<i>Run Numbers</i>	<i>Description</i>	<i>Spin</i>	<i>SFR</i>	<i>Notes</i>
1	486	9.105		41007 - 41009	Pedestal	up		Secondary Sutter Closed 4j collimator set
2	486	9.146		41010 - 41012	Polarized Cell	up		
3	486	9.124		41013 - 41015	Polarized Cell	up		Data in blue optimize SFR vs changes in guide field
4	486	9.151		41016 - 41018	Polarized Cell	up		
5	486	9.077		41019 - 41021	Polarized Cell	up		
6	486	9.059		41022 - 41024	Polarized Cell	up		
7	484	9.105		41025-41027	Polarized Cell	up		This was a mistake
8	486	9.105		41028 - 41030	Polarized Cell	up		
9	386	9.105		41031 - 41033	Polarized Cell	up		
10	286	9.105		41034 - 41036	Polarized Cell	up		
11	586	9.105		41037 - 41039	Polarized Cell	up		41037 is bad
12	686	9.105		41040 - 41042	Polarized Cell	up		
13	476	9.105		41043 - 41045	Polarized Cell	up		41044 has RFSF phase shift
14	466	9.105		41046 - 41048	Polarized Cell	up		
15	456	9.105		41049 - 41051	Polarized Cell	up		
16	496	9.105		41052 - 41054	Polarized Cell	up		
17	506	9.105		41055 - 41057	Polarized Cell	up		
18	516	9.105		41058 - 41060	Polarized Cell	up		

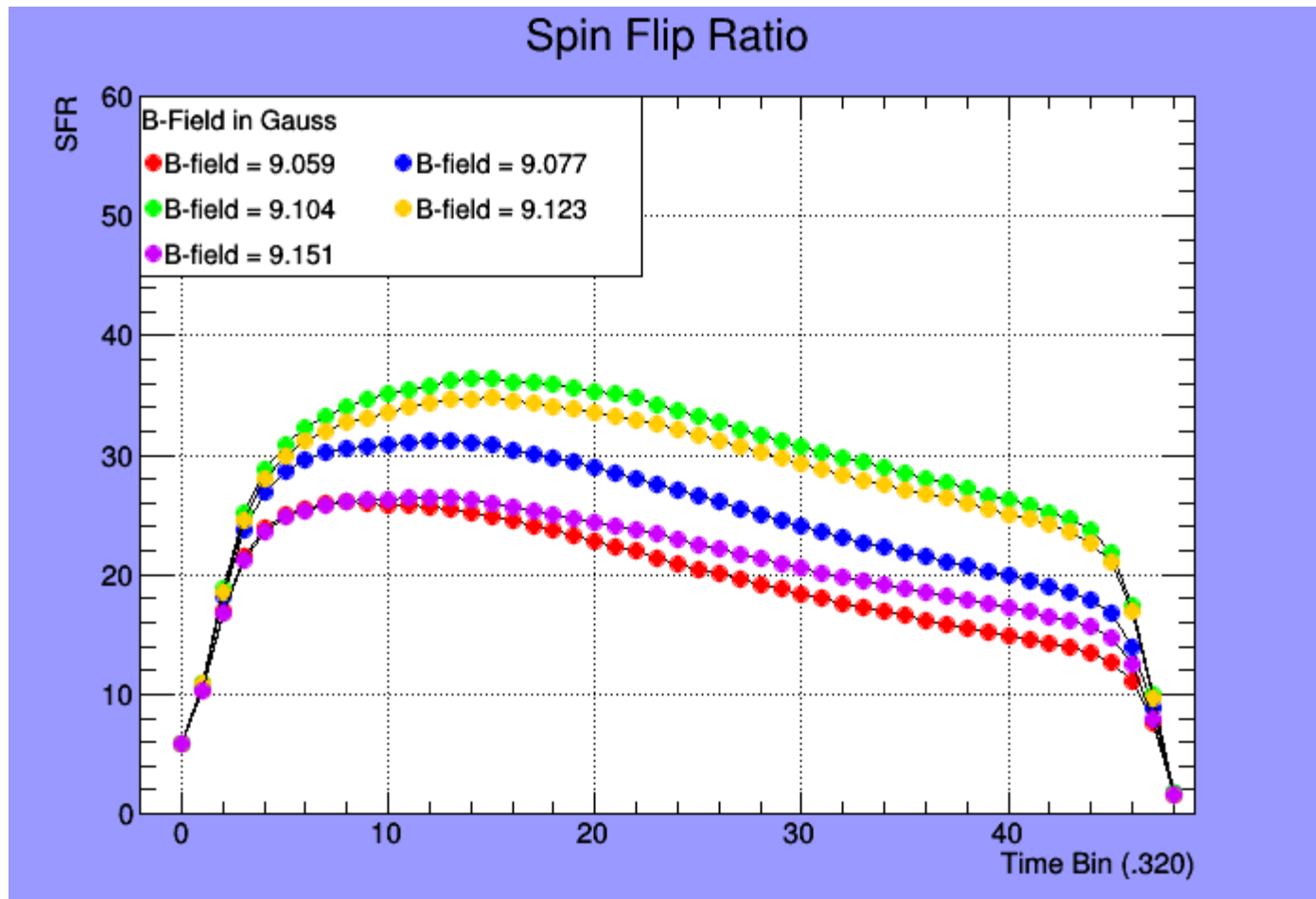
Data Runs

19	486	9.105		41061 - 41063	Polarized Cell	dn		
20	386	9.105		41064 - 41066	Polarized Cell	dn		41064 has RFSF phase shift
21	286	9.105		41067 - 41069	Polarized Cell	dn		
22	586	9.105		41070 - 41072	Polarized Cell	dn		
23	686	9.105		41073 - 41075	Polarized Cell	dn		
24	476	9.105		41076 - 41078	Polarized Cell	dn		
25	466	9.105		41079 - 41081	Polarized Cell	dn		
26	456	9.105		41082 - 41084	Polarized Cell	dn		
27	496	9.105		41085 - 41087	Polarized Cell	dn		
28	506	9.105		41088 - 41090	Polarized Cell	dn		
29	516	9.105		41091 - 41093	Polarized Cell	dn		
								2nd AFP FLIP
30	486	9.105		41094 - 41096	Polarized Cell	up		
31	386	9.105		41097 - 41099	Polarized Cell	up		
32	286	9.105		41100 - 41102	Polarized Cell	up		
33	586	9.105		41103 - 41105	Polarized Cell	up		
34	686	9.105		41106 - 41108	Polarized Cell	up		
35	476	9.105		41109 - 41111	Polarized Cell	up		
36	466	9.105		41112- 41114	Polarized Cell	up		
37	456	9.105		41115 - 41117	Polarized Cell	up		
38	496	9.105		41118- 41120	Polarized Cell	up		
39	506	9.105		41121 - 41123	Polarized Cell	up		
40	516	9.105		41124 - 41126	Polarized Cell	up		

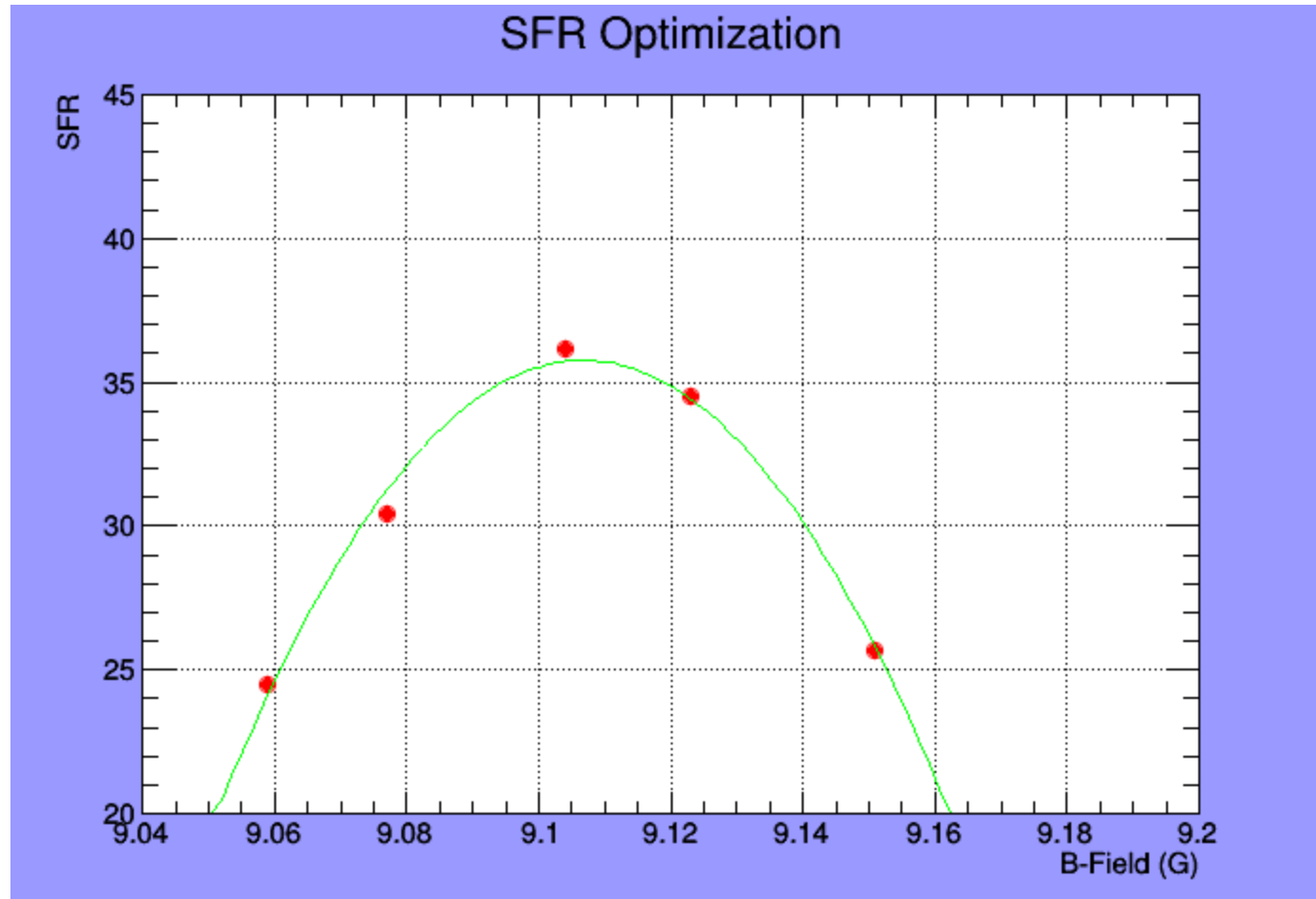
Data Runs

41	486	9.105		41127 - 41128	NW2.283			The data runs are tests of different waveforms
42	486	9.105		41129 - 41130	NW2.304			in the AFG 3022
43	486	9.105		41131 - 41132	NW2.336			
44	486	9.105		41133 - 41134	NW2.370			
45	486	9.105		41135 - 41136	NW2.398			
46	486	9.105		41137 - 41138	NW2.427			
47	486	9.105		41139 - 41140	NW2.370			AFP Flip
48	486	9.105		41141 - 41142	NW2.370			2nd AFP Flip
								Return to USER 4
49	486	9.105		41143 - 41146	De-polarized cell			41144 and 41145 are good

Optimization of SFR



Optimization of SFR



Optimization Data

41023	9.059	24.5041
41020	9.077	30.4475
41011	9.104	36.1441
41014	9.123	34.516
41017	9.151	25.6622

Minimizer is Minuit / Migrad

Chi2 = 0.977555

NDf = 2

Edm = 5.81371e-07

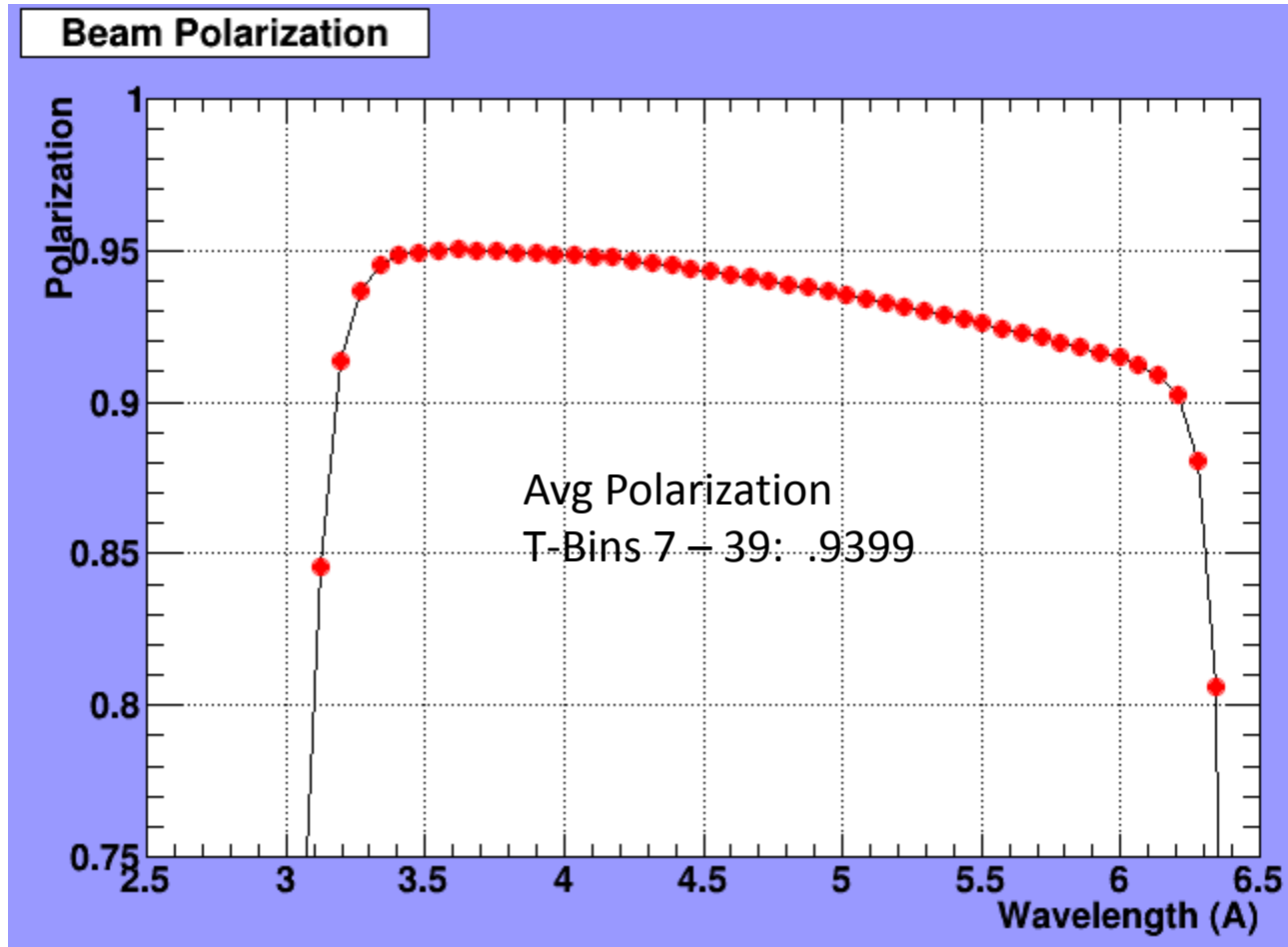
NCalls = 267

coefficient = 5106.79 +/- 351.09

best_fit = 9.10677 +/- 0.00095076

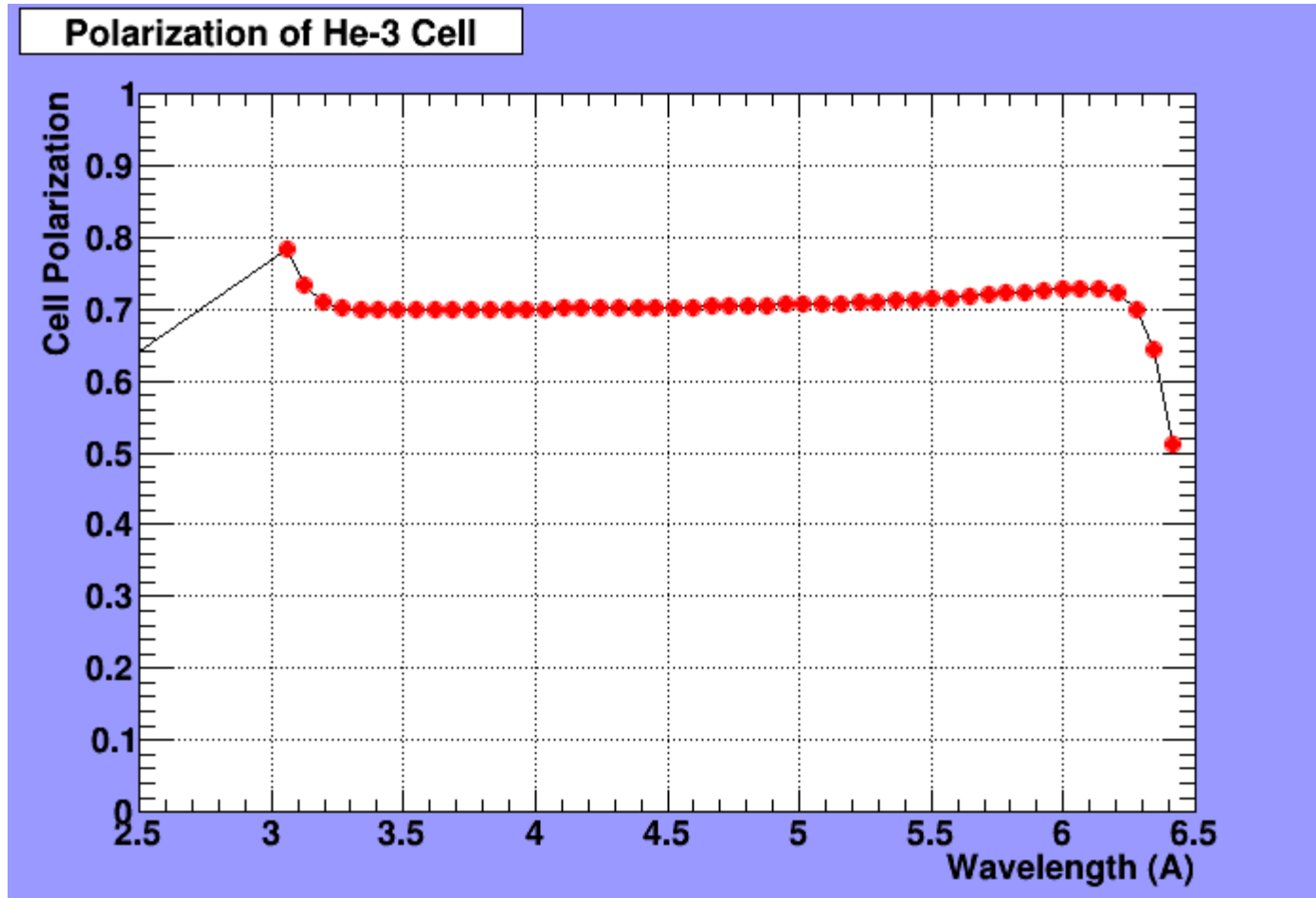
best_sfr = 35.7659 +/- 0.488022

Beam Polarization



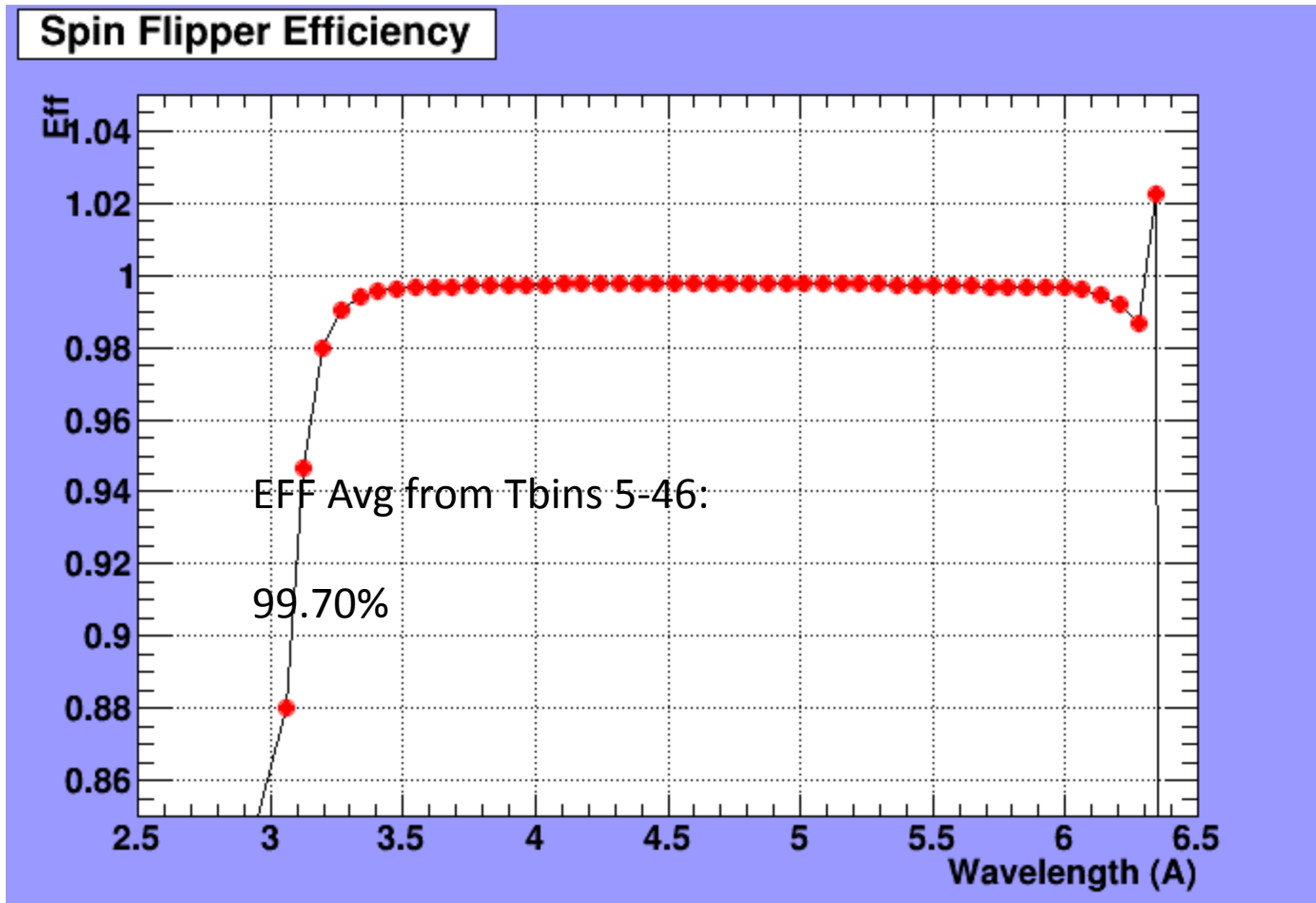
Dipol.cc(41028, 41144, 41007)

Cell Polarization



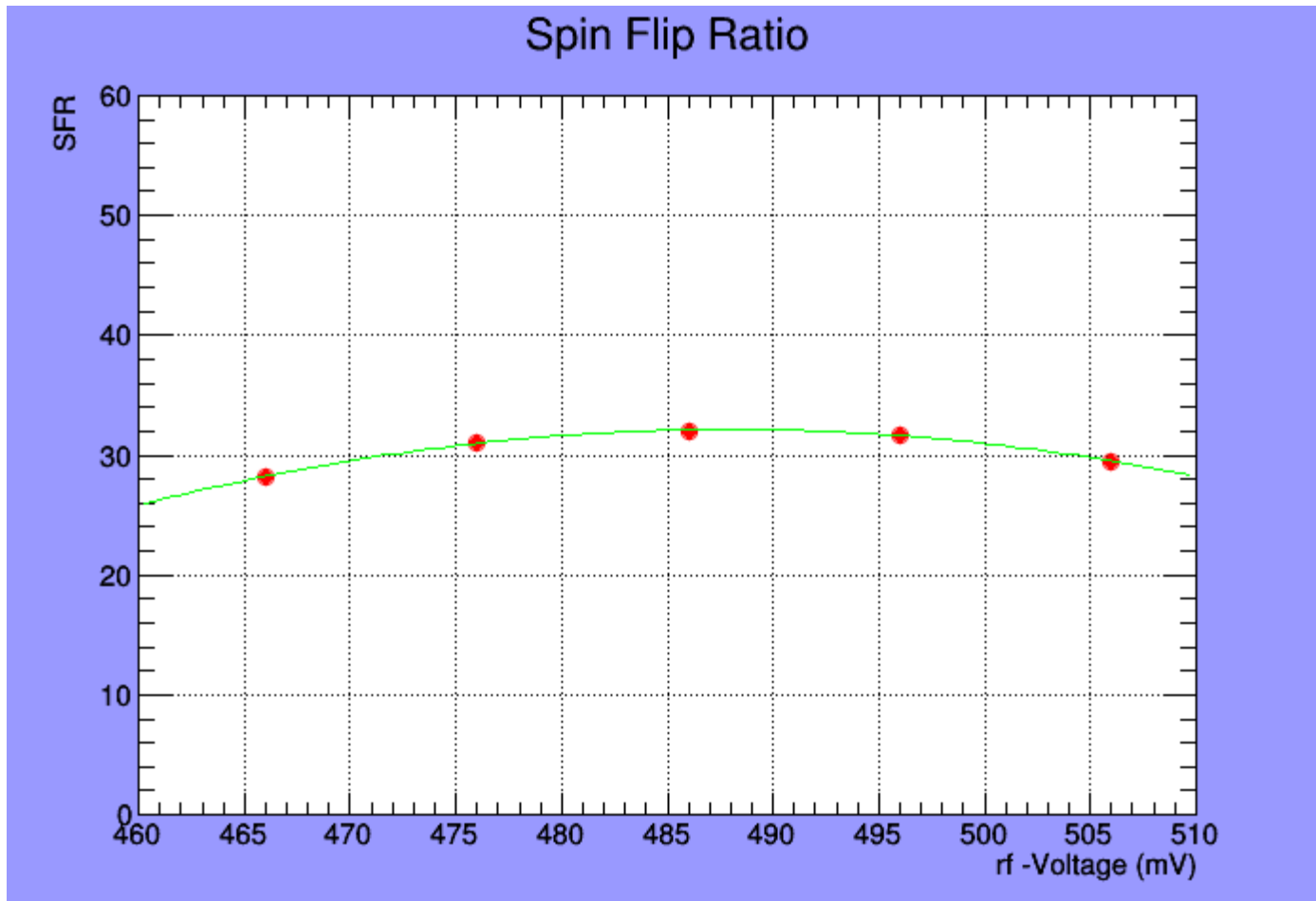
Dipol.cc(41028, 41144, 41007)

Spin Flipper Efficiency



Dirfsf.cc(41028, 41061, 41094, 41007)

Function Generator Voltage Optimization



Function Generator Voltage Optimization

41046	466	28.2345
41043	476	31.0172
41028	486	32.0427
41052	496	31.6918
41055	506	29.4938

Minimizer is Minuit / Migrad

Chi2 = 3.48197e-07

NDf = 0

Edm = 6.96318e-07

NCalls = 119

coefficient = 0.00688044 +/- 0.0122524

best_fit = 488.448 +/- 6.74068

best_sfr = 32.0839 +/- 0.956936

Optimization of $1/t$ Envelope

SFR vs decay rate of $1/t$ envelope

