

Measurement of the tagger magnet excitation curve H. Egiyan, S. Stepanyan

Power supply of the Hall B tagger magnet will be replaced with a new one during the summer shutdown. In order to have cross calibration of the new and old power supplies magnet excitation curve, B field vs current, will be measured before and after replacing PS.

Magnetic field will be measured using the hall probe, that is installed in the vacuum box, at the upstream end of the magnet. Hall probe will be read-out by Lake Shore Gauss-meter, model 450. Accuracy of the device is on the order of 10^{-4} .

Procedure for the measurements will be as following:

- Set the current to the highest value (2400A);
- Step down in the current with given steps:
 1. Step size for the range from 2400A to 1400A is 100A;
 2. Step size for the range from 1400A to 200A is 200A;
- Wait 15 minutes at each step before the reading the field value from the Gauss-meter (hall probe), and the current value from the read back of PS.

Total number of settings 19, time for measurements \sim 5 hours.

The first measurement with the old power supply was performed on July 6. Measurements were automated. Separate GUI is build to control the process (Hovanes Egiyan). It allows to set the range and the step size of the measured currents, shows the progress of the measurement, and writes results to the disk. In Table 1 results of the measurement is presented together with

values of the field from the tagger article, *NIM A 440 (2000) pp. 263-284*. Corresponding excitation curve is presented in Figure 1.

Table 1: Results of the tagger magnet field vs current measurements with the old PS.

Current set point (A)	Current read-back (A)	Field value (T)	Previous field measurement ¹ (T)
2400	2399.25	-1.7364	1.7335
2300	2299.29	-1.6988	
2200	2199.45	-1.6586	1.6566
2100	2099.34	-1.6152	
2000	1999.5	-1.5685	1.5674
1900	1899.42	-1.5175	
1800	1799.58	-1.4607	1.4611
1700	1699.56	-1.3959	
1600	1599.63	-1.3231	
1500	1499.67	-1.2458	
1400	1399.59	-1.1662	1.1669
1200	1199.64	-1.0036	
1000	999.66	-0.8391	0.8388
800	799.65	-0.6735	0.6731
600	599.67	-0.5071	0.5062
400	399.75	-0.3404	
200	199.74	-0.17331	
100	99.78	-0.08965	
0	0	-0.0028 ²	

¹Interpolated at the probe position.

²After degaussing.

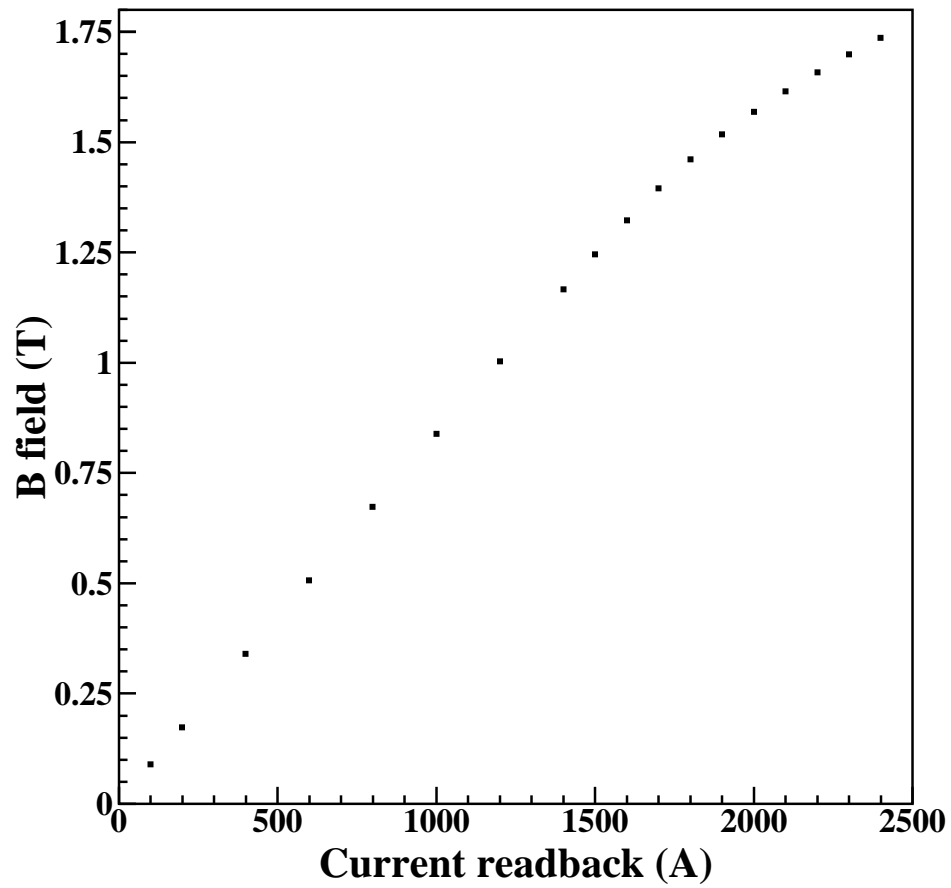


Figure 1: Hall B tagger magnet excitation curve with old power supply.