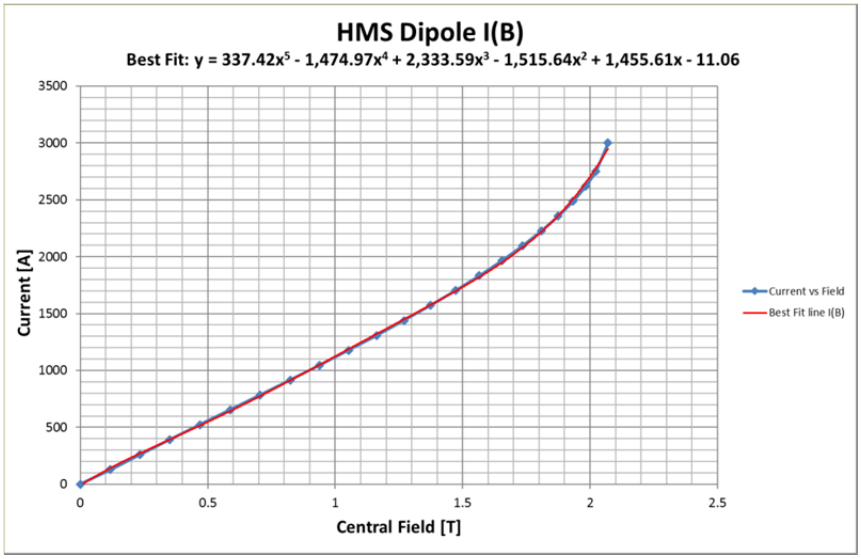
HALL C PLC TASKS REPORT (07/05/2018 – 07/11/2018)

Hall C - PLC Task List							
Item	Description	Priority	Primary Person	Start Date	Status	Comments	Suggested Duration (days) by Hall C
1	HMS & SHMS Dipole field regulation routine	1	Pablo	14-Jun-18	In Progress	Requested and received HMS sample table for I(B). Started PLC code	10
2	New NMR communication through PLC to PSU	1	Brian	10-May-18	In Progress	Received probe to test field readouts in NMR. Magnet needed to simulate magnetic field within probe operation range (1.13-3.4 T). Using permanent magnet on hand (B ≈ 1.0 T), PT2026 was unable to lock on to field since probe's operating range is too high (1.13 T minimum field required for probe).	5
3	Test Ethernet vs Controlnet interface.	1	Pablo	7-Jun-18	Completed	Checked by Steve(w/o redundancy modules)	N/A
4	Swapping of Controlnet by Ethernet modules in SHMS	1	Pablo-Brian	3-Jul-18	In Progress	Started upgrades for SHMS PLC from v16 to v20. Installed RSLOGIX5000 V20 and RSNetwork v26 on "skylla7" firmware upgrades for communication modules in progress. Re-synchronization of redundancy modules in progress	N/A
5	Add spectrometer rotation electric break control	2	TBD	-	Waiting	Waiting for Hall C to determine and order parts	5
6	Add HMS Spectrometer Vacuum to controls	2	Tyler	29-May-18	Waiting	Hall C must decide which type of vacuum gauge will be used and procure it.	2
7	Data Logging upgrade, install and make operational	2	TBD	-	Not started	DSG prefers data to be log by EPICS	20
8	Develop "on loop" current regulation routine for quads' (3) PSU.	2	Amanda	14-Jun-18	In Progress	Completed flow chart for current monitoring loop. Started PLC code	10
9	Tune valve responses	2	TBD	-	Not started	Need more information	5
10	Wire UPS status to controls	2	Tyler	30-May-18	In Progress	Received and installed connector to terminal block adaptor.	2
11	Modify SHMS shutter not in place status	2	Amanda	-	Waiting	Mike will talk to Steve on implementing wire loop to determine "shutter in-place" status	1
12	Add HMS shutter controls and status	3	TBD	-	Waiting	Mike will talk to Steve on implementing wire loop to determine "shutter in-place" status	1
~~13~~	~~Alarm notification to on-call staff~~	~~3~~	~~TBD~~	~~-~~	~~Not started~~	Should be done by EPICS	~~4~~
14	Add HMS quadrupoles hall probe readouts to PLC	3	Tyler	-	In Progress	Started to look at HMS PLC code.	3
15	Change SHMS LVDT I/O module from Differential to Single ended	3	TBD	-	Not started	Need information abput available hardware	4
16	End of life for Windows 7 upgrade to windows 10 (next year?)	4	TBD	-	In Progress	Need to update RSLOGIX 5000 from v16 to v20. Computer center needs to upgrade to windows 10.	10

- Investigated error code received when two ControlNet modules were swapped with two Ethernet modules (ENBT and EN2T) in the SHMS Q1 and Heater Exchanger (HX) PLC chassis.
  - Cause of error not found after testing and debugging ENBT and EN2T Ethernet modules on DSG-PLC and Standalone PLC test stations.
  - When contacted, Rockwell tech support concluded that neither EN2T nor ENBT module can be used with RSLogix 5000 version 16.
    - DSG did not agree with their conclusion since a previous test on Standalone PLC was performed successfully with similar conditions and configurations as the SHMS system.
- Second test successfully performed on Standalone PLC with DSG-PLC chassis and EN2T and ENBT modules in configuration that mimics the SHMS PLC system.
  - Used ENBT firmware revision 4.8, EN2T firmware revision 2.7, and RSLogix 5000 v16.
  - After test, noted that the only major difference between test setup and actual SHMS PLC systems was the redundancy configuration.
  - Contacted Rockwell tech support again with the results of test, resulting in the conclusion that:
    - ENBT and EN2T modules can be use with RSLogix 5000 v16 if redundancy system is not used.
    - With redundancy system, firmware upgrades for ENBT to v6.01 and EN2T to v4.2 are required.
  - Required firmware for the two Ethernet modules are not supported by RSLogix 5000 v16.
- RSLogix5000 must be updated from version 16 to version 20 to use Ethernet modules in the SHMS Q1 and HX PLC chassis.
  - Version 20 is the latest the SHMS's 1756-L62 model PLC controller can support.
  - Version 20 is also compatible with Windows 10.
  - If any version newer than v20 is desired, different PLC controllers will be needed.
- Development started of PLC routine for Dipole field regulation.
  - Requested and received table for I(**B**) relation to add to the PLC code.

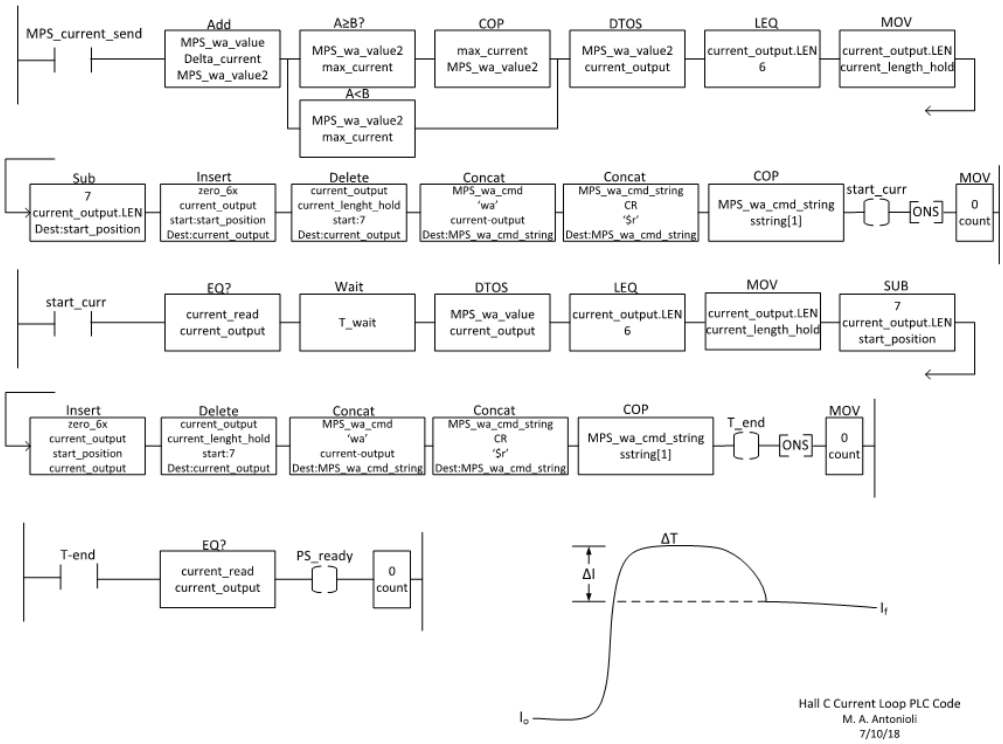


Plot generated from received table of I(**B**) relation. Data was fit with a fifth-degree polynomial fit.

- NMR probe for PT2026 borrowed from Hall C for SBC code development.
  - With probe, PT2026 can be used to test field lock and readback functions in SBC's code.
  - Using permanent magnet on hand (**B** ≈ 1.0 T), PT2026 was unable to lock on to field as probe's operating range is too high (1.13 T minimum field required for probe).

- Will need to order a permanent magnet with higher field to allow NMR unit to get a lock on to field for further testing of the SBC code.

- Current monitoring loop PLC routine for quads completed.
- 37-pin D-sub-to-terminal-block adapter ordered and received for UPS monitoring wiring.
- Documentation generated for Hall C PLC System:
  - "Ladder-Logic" flow chart of current regulation loop



Hall C Current Loop PLC Code "Ladder-Logic" flow chart.