DSG-HDice R&D Meeting Minutes

Date: October 30, 2020
Time: 11:00AM – 11:30PM

Attendees: Peter Bonneau, Aaron Brown, Pablo Campero, Tyler Lemon, Marc McMullen, and Amrit Yegneswaran

1. HDice will not use or further investigate the Zurich lock-in amplifier's boxcar averager
    1.1. HDice group met with Zurich representatives and through tests and discussion with the representative, it was determined that boxcar averager is not suitable for NMR measurements

2. Discussed power supply problems of October 19, 2020 resolved by Brian Eng
    2.1. HDice group requested "emergency" support because the magnetic field swept NMR program was returning errors
    2.2. After investigation, Brian found causes of error
        2.2.1. GPIB address conflict caused by second power supply being controlled by two GPIB controllers rather than only one controller
            2.2.1.1. Previously program used only one GPIB controller, where now in UITF, power supplies each have their own GPIB controller
        2.2.2. Incorrect field-to-current relation value for IBC
            2.2.2.1. Value was set at 196.06 Gauss/Amp instead of 185.93 Gauss/Amp
            2.2.2.2. Caused program to time out when ramping magnet to a set field because program would not reach field at the current set
            2.2.2.3. Updating conversion constant resolved error

3. Discussed new HDice requests made week of October 26 – 30, 2020
    3.1. Request 1: Add ability to remotely set SR844 lock-in amplifier's signal input impedance to either 50 Ω or 1 MΩ
        3.1.1. Request completed; new pop-up window prompts user to select impedance
    3.2. Request 2: Add error handling to subVI used to fit background amplitude data when background analysis is used
        3.2.1. Program was returning error if there was no peak in background amplitude data
            3.2.1.1. Occasionally, HDice takes data in a frequency range where there is no NMR peak, causing program error that Gaussian fit peak was NaN (not a number)
        3.2.2. Request completed; added check on fit result so that if peak is NaN, then program uses absolute maximum of background amplitude instead of peak of Gaussian fit