DSG-HDice R&D Meeting Minutes

Date: September 25, 2020
Time: 11:00AM – 11:30PM

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

1. Discussed problem of controlling two Oxford IPS 120 power supplies from two separate VIs.
    - 1.1. GPIB controller cannot simultaneously communicate with two devices.
    - 1.2. There will be a single program to control both power supplies, which only allows communication to/from one GPIB device at a time.

2. Discussed questions for meeting with Zurich representative on boxcar averager and lock-in amplifier.
    - 2.1. Boxcar averager questions
        - 2.1.1. Is boxcar averager a separate device or is it software activation on the Zurich lock-in amplifier?
        - 2.1.2. Is boxcar averager applicable to the signals seen for NMR measurements?
            - 2.1.2.1. Appears to be more suited for fast, kHz peaks where the period between peaks is known.
            - 2.1.2.2. Is there an example with slower signals?
    - 2.2. General lock-in amplifier questions
        - 2.2.1. With the "Reference" options, the manual says that new data is divided by reference data. Is there a configuration where the reference signal can be subtracted from the new signal?
        - 2.2.2. Is there a way to do more complicated math using sweep results?
            - 2.2.2.1. Can extracted information of signal's peak be used as one of the components of a calculation?
        - 2.2.3. What is the preferred programming interface for lock-in amplifier (LabVIEW, Python, other)?
            - 2.2.3.1. What interface is LabOne using?

3. Tyler Lemon will add details for each general development task on fsNMR schedule.

4. Tyler Lemon will create a system diagram for fsNMR program with Zurich lock-in amplifier.