MDPX sample database information

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This sample experimental run gives the general layout for the type of information that we will want to store. In the final version we will require many more data fields than are provided here but this should give a general idea of the overall setup.

The "experiment" conducted here records a measurement by a probe within the plasma at three different locations. Each of the three probe measurements records two values as a function of time: Voltage applied to and current collected by the probe.

The following information is recorded as a time series during the course of each probe measurement:

- The voltage and current of the probe.
- The signal from the gauge that measures the gas pressure within the vacuum vessel.
- The signals from the power supplies that create the plasma.

The following information is recorded once as the "experiment setup" information with each of the three probe measurements:

- Various settings for the experimental conditions.
- The physical configuration of the experiment.
- The background information about the probe.
- Experiment user, date, etc.

The above data can be thought of as the information needed for the "science data" runs. We will also be recording some of the same information continuously (24 hours per day, 7 days per week), but at a lower rate. These data will be stored in a separate location from the "science data".

The attached Excel spreadsheet (MDPX_SampleDatabaseInformation_SampleRuns_v1) contains a simplified list of the database-type information we would need for both the continuous and science data sets. In the section labeled “science data runs” I have highlighted the quantities that change in red (in the hypothetical experiment we are moving “probe-1” by 1 cm and repeating the same measurement three times).

The second spreadsheet (MDPX_SampleDatabaseInformation_organization_v1) contains more detailed information for the first science data run (time = 113214). The top section (“Experimental Setup Information”) of the spreadsheet indicates quantities that will be recorded once per data run. The bottom section (“High speed data“) indicates quantities that will be recorded as a time series. In the “Experimental Setup Information” section I have indicated if a field would need to be searchable and whether the entry would need to point to an external file. For example, row 9 lists “Vacuum chamber configuration”: There will be a finite number of different vacuum chamber configurations we can use in the experiment, the experiment user would choose the active configuration from a list (or add in a new one if it has not previously been used). Here I have chosen “Oct-a-1” (the “octagon chamber a, vacuum configuration 1”). We would want to be able to search the database for experiments that are performed with “Oct-a-1”. Additionally, by selecting a vacuum chamber configuration we would need to be able to link (or similar) to a file that contains a detailed description of the configuration. I have included an empty text file for each spreadsheet entry that indicates that it needs to be linked to a file (this does not need to be the structure that we eventually use, but I thought having *something* might be useful).