# Setting up MPMS-3 measurements

Example sequences are located in a subfolder of `c:\QdSquidVsm\Sequence` folder and you should find one that will help you set the right parameters. In addition, there is a `reference samples` folder there showing data from reference samples kept in the lab (films with IMA or PMA, Kapton tape…). These samples and associated data are sometimes extremely helpful in getting started and in setting expectations about your sample's behavior.

Below are some important things to note and which sometimes trip up new users.

One type of measurement at a time: In the measurement dialog (Moment vs Field, Moment vs Temperature, or Measure – see below), select only ONE type: VSM, DC or AC. If you want to do make more than one of these, do them in separate commands.
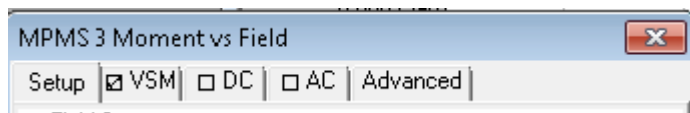
DO NOT sweep field while measuring the magnetic moment: while this is OK in VSMs, a SQUID is very sensitive to field ramping effects so each measurement should be done "Stable at each field" instead of "Sweep continuously".

This will affect **all measurement modes**: VSM, DC Scan and AC susceptibility.

SQUID drifts seen after stabilizing field:

even after stabilizing field, one can still see drifts in the several e-7 emu range in the reported moment. This can occur for any of the three measurement modes and is most visible in the field range 1000-4000 Oe. The SQUID sees magnetic flux movement in the magnet and in the above field region there is a lot of movement which leads to systematic offsets in the reported moment immediately after arriving at a new field. As mentioned in the general magnetic field training for MPMS-3, this drift is typically no more than ~2e-7 emu.

⇨ Remedy this by making multiple measurements at a given field (see "repetitions at each field" in Moment vs Field dialog) and later filtering on "Measurement Number" in .DAT file

Measure a magnetic "blank" sample:

This is always advisable in magnetic measurements to distinguish your sample from the holder/tape/carrier/instrument background. Best to do blank – sample – blank in that order to ensure the blank was stable.

Note about DC Scan measurements in Oven mode:

Typically VSM mode is used for the oven mode, but in some cases DC Scan is required (e.g., powder samples packed in foil – contact Neil for guidance before doing this sample mounting!).
In the case of DC Scan, the oven AC heater signal will swamp the magnetic signal in the SQUID, so we have found that setting a **Scan Time of 3.35 sec** will minimize this effect. This value can be entered into the Scan Time field (even though it is also a dropdown menu). Note that this is not relevant for VSM

mode measurements.
See example sequence in `c:\QdSquidVsm\Sequence\example sequences...`

M(T) and M(H) OVEN DC Scan mode.seq
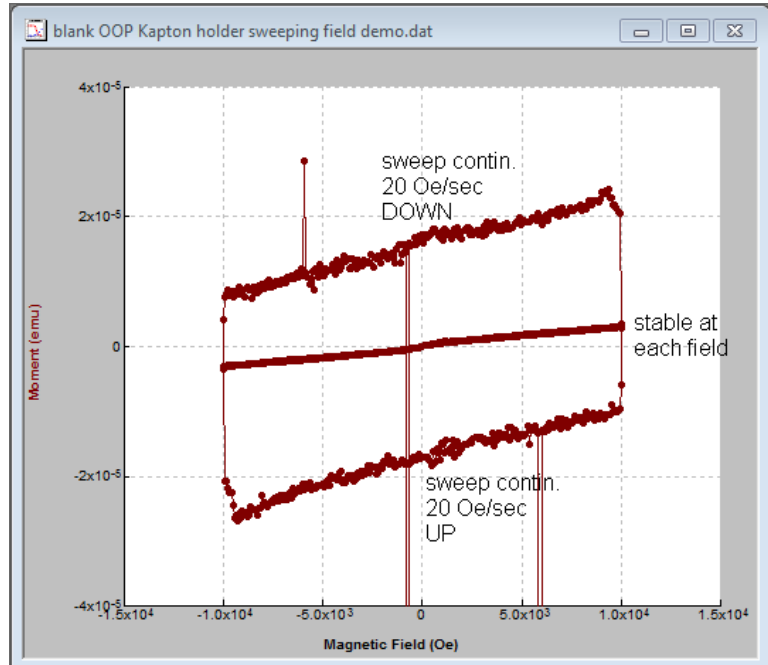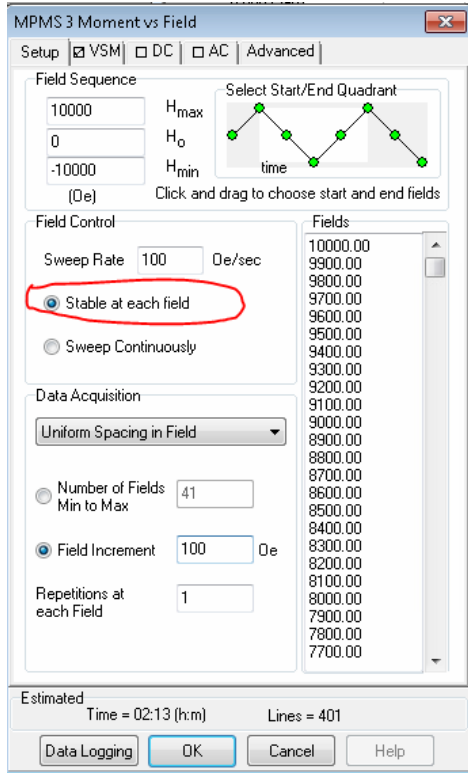
Graph shows the impact of sweeping the field on the M(H) loop of a blank holder with Kapton tape: ~3e-5 emu vertical shift in DOWN vs. UP sweeping data, and noise level is much higher.