

Setting up the MHATT-CAT Ge detector

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The single element Ge detector on 7ID is an efficient detector for fluorescence detection or energy dispersive diffraction. Its ultimate resolution is about 145 eV. It is equipped with a thin Be window (1 mil) to detect soft X-rays. This window is fragile, so please keep the protectig cap on when the detector is not in use. Don Walko has also built a foil holder to mount foils in front of the window. This document is written as notes for users as to how to set it up efficiently.

1 Connection and initial cool down

This detector should be connected to the mini NIM-BIN set up for it. This NIM-BIN has two pre-amp power output that are convenient to use for this detector's two pre-amp connections. It also holds a Canberra AIM-MCA, with EPICS support, a HV power supply, the Ortec 659, and an amplifier the Ortec 671. The list below provides the steps to start up the system.

- Cool down the system at least six hours before the start of the experiment. The manufacturer recommends 6 hours minimum although 24 hours is better if possible. Fill-in the LN2 daily.
- Connect the Ge SHV cable to the HV supply SHV back panel connector 0-5kV.
- Connect the Ge HV-STDN cable to the HV supply back panel Shutdown BNC connector. The Ge detector is equipped with a temperature sensor which is sensed by the HV power supply. If the detector warms up, the HV power shuts down.
- Connect the Ge shutdown circuit pre-amp power to the NIM pre-amp power connector (at the back of the NIM BIN).

Table 1: MHATT-CAT Ortec 671 Amplifier settings for the Ge detector. The settings below have been used for energy dispersive diffraction in 7ID-B.

coarse gain	50
fine gain	0.8
shapping time	0.5 μ s
shaping mode	Gauss
Pole zero PZ	Auto
Input polarity	Neg.

- Connect the Ge OUT cable to the Amplifier's Input connector.
- Connect the Ge INH (inhibit) cable to the Amplifier INH BNC connector.
- Connect the Ge pre-amp to the other NIM bin pre-amp power or the back of the amplifier connector.
- When the cooldown period has been completed, apply -1000 V to the Ge detector gradually. Once the HV switch is turned on, press reset to operate the HV circuit. When you are finished with the detector, turn the HV down slowly as well.
- Connect a scope to the amplifier Unipolar output and test the detector with a sealed source (we use Fe 55 and Cd 109). Terminate the signal cable coming from within the hutch with a 50 Ω terminator.

References

- [1] http://www.aps.anl.gov/xfd/bcda/Documents/Motion_Standards/motor_table.html