

Preparations for EEMCAL Readout Chain Prototype Tests 2024

- ❑ Radiator (Summer 2024): CUA, JMU, MIT, ...
 - Dimensions
 - Transmission
 - Light Yield
 - Ship crystals to, e.g., IJCLab-Orsay (→ may need formal procedure as most crystals JLab owned)
- ❑ SiPM and readout chain (Summer 2024): ACU, OU, ...
 - **Decide on pixel pitch** – all other steps depend on it, so should be done very soon (→ mechanism?)
 - Purchase SiPMs: to instrument with 4 SiPM/crystal need: 100 SiPMs for a 5x5 array (→funds?)
 - Complete PCB board development
 - Test PCB board
 - Materials survey (e.g., for discrete: fADC, VME crate, LV supply, amplifier+cables, LV and bias cables, oscilloscope, , etc.) → would all of this need to be shipped to DESY? If so, how do we do that?
 - Ship materials to DESY
- ❑ Mechanical Construction: IJCLab-Orsay, MIT
 - Wrapping crystals with reflector
 - Construct prototype
 - Materials survey (HV/signal long cables, alignment materials, oscilloscope, , etc.)
 - Ship materials to DESY (→ funds?)
- ❑ Simulations: UKY, AANL, ...
 - Geometry and material
 - Digitization
- ❑ Cosmic Test: IJCLab-Orsay, ...
 - Demonstrate working prototype on test bench: Light yield with SiPM readout (PCB + boards)
- ❑ Data acquisition and analysis
 - Any special requirements?

MIT 5x5 Prototype Materials List

- ❑ (From Douglas) MIT would bring/ship these to DESY for the beam test:
 - the 5x5 PbWO4 calorimeter plus 5 spare crystals and spare PMTs and ESR foil.
 - LeCroy 1458 HV Mainframe and a number of -HV and +HV pods. The PMTs typically take \sim -1000 V at room temperature.
 - VME crate with controller, 32 channel CAEN QDC, and two 16 channel CAEN Digitizers
 - splitter panels if you want to run QDC and Digitizer in parallel
 - 100' of signal cables (need the length to delay signal until trigger electronics is ready to give trigger)
 - HV cables
 - fibre optic cables
 - chiller ? (I don't think you will want to cool the calorimeter too much but maybe a stable temperature is useful at 15 - 25 C can use just water as the recirculating fluid). Transformer for German power.
 - a trigger scintillator with PMT
 - one or two computers with monitor, key board, etc.
 - toolbox and various odds and ends

- (Carlos) Could we make a similar list for the IJCLab-Orsay prototype?
- (Justin) Could we make a similar list for the discrete readout specifics, e.g., amplifiers, LV+bias+cables, VXS crate (if that is needed), etc.

IJCLab 5x5 Prototype Materials List

- ❑ IJCLab would bring/ship these to DESY for the beam test:
 - the 5x5 prototype (currently not yet instrumented with crystals and SiPMs)
 - HGCRROC readout frame (protoboard, KCU, adaptor board)
 - Power supply
 - Oscilloscope
 - 16-channel wavecatcher (flashADCs) unit
 - Chiller (and hoses)
 - Linux laptop

