

07.07.2021



Calorimeter status for GSI 2021

Physics meeting

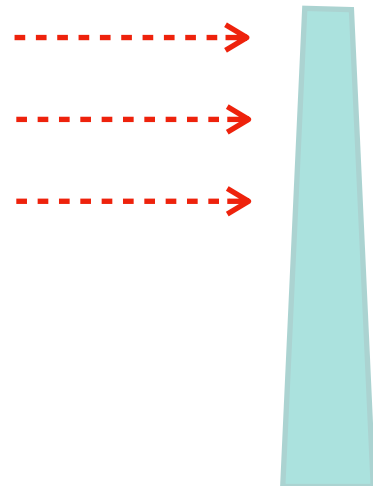
N. Bartosik, P. Cerello, M. Penna, L. Scavarda

Test beam at CNAO 27-28 June. Goals:

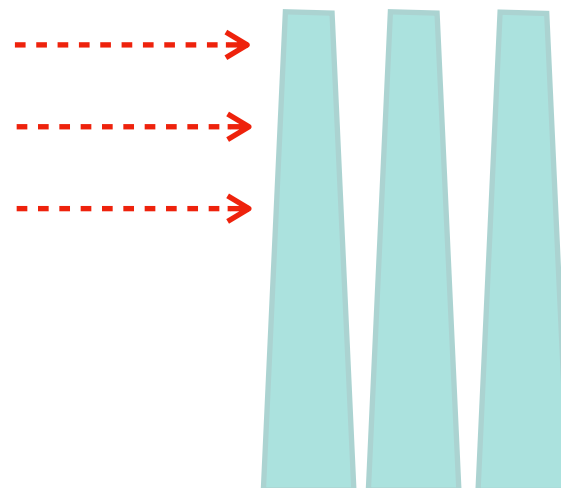
- Temperature monitoring by means Arduino
- Validate the crystals inter-calibration protocol:
 - scan with p (70, 120, 170, 227 MeV) and ^{12}C (115, 190, 260, 330, 400 MeV/A) on 3 different BGO crystals.



- scan with 70 MeV p and 115 MeV/A ^{12}C on 3 different BGO crystals rotated by 90° at different depths (15, 45, 75, 105, 135, 165, 195, 225 mm).



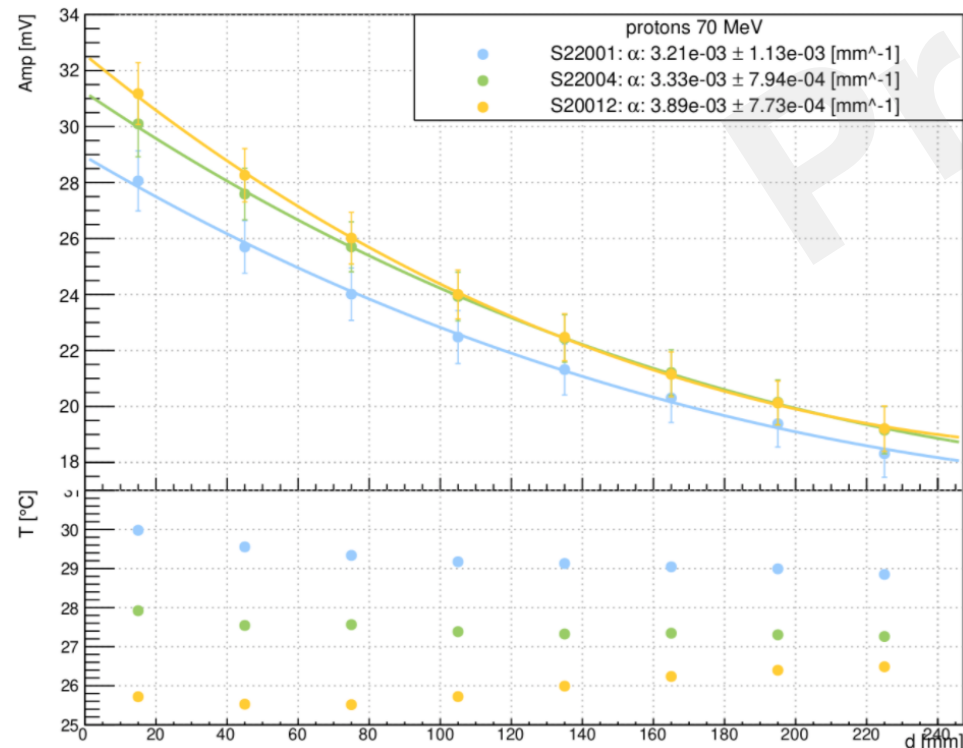
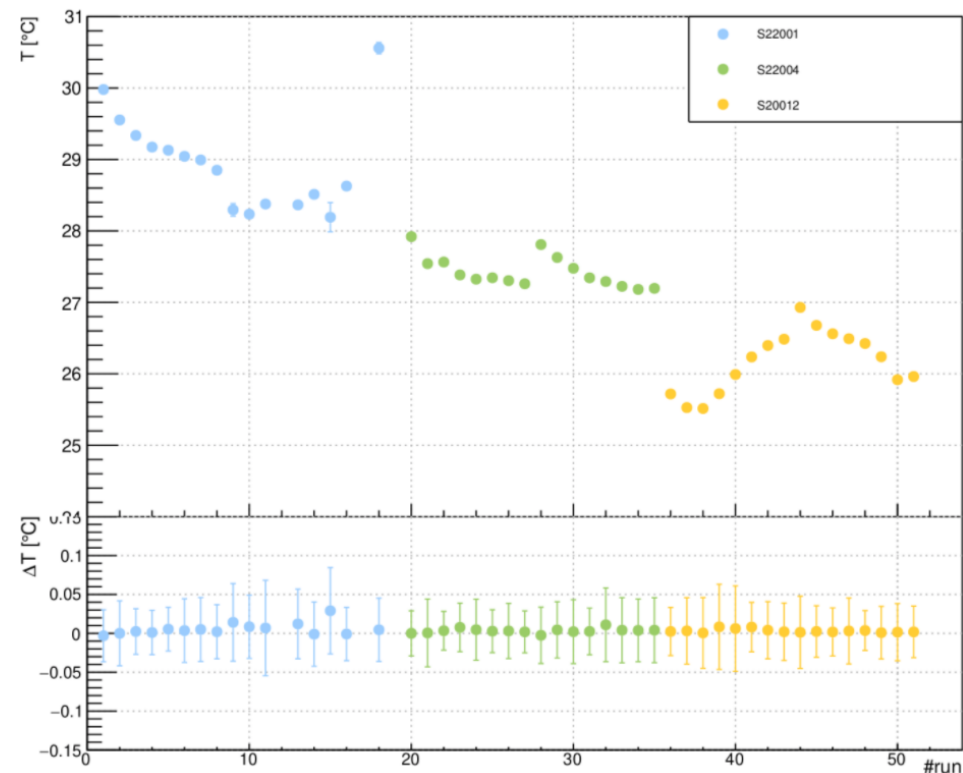
- scan with 170 MeV p and 330 MeV/A C impinging on 3 stacked BGO crystals rotated by 90° at different depths to validate the inter-calibration protocol (energy deposited in ≥ 2 crystals).



Preliminary Results



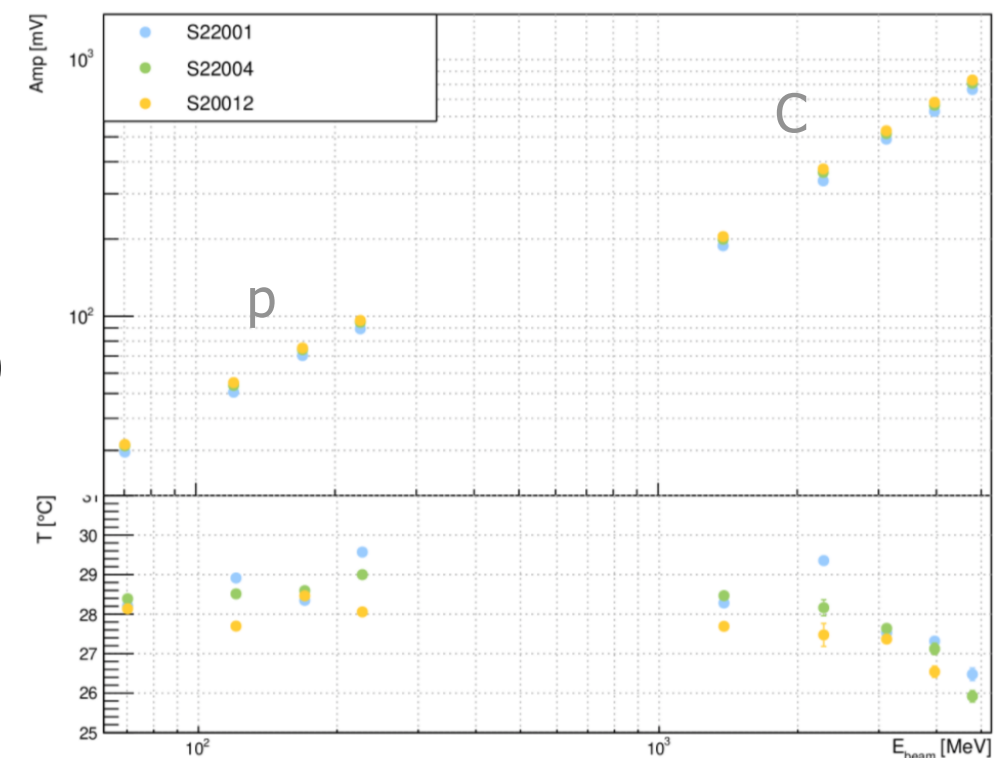
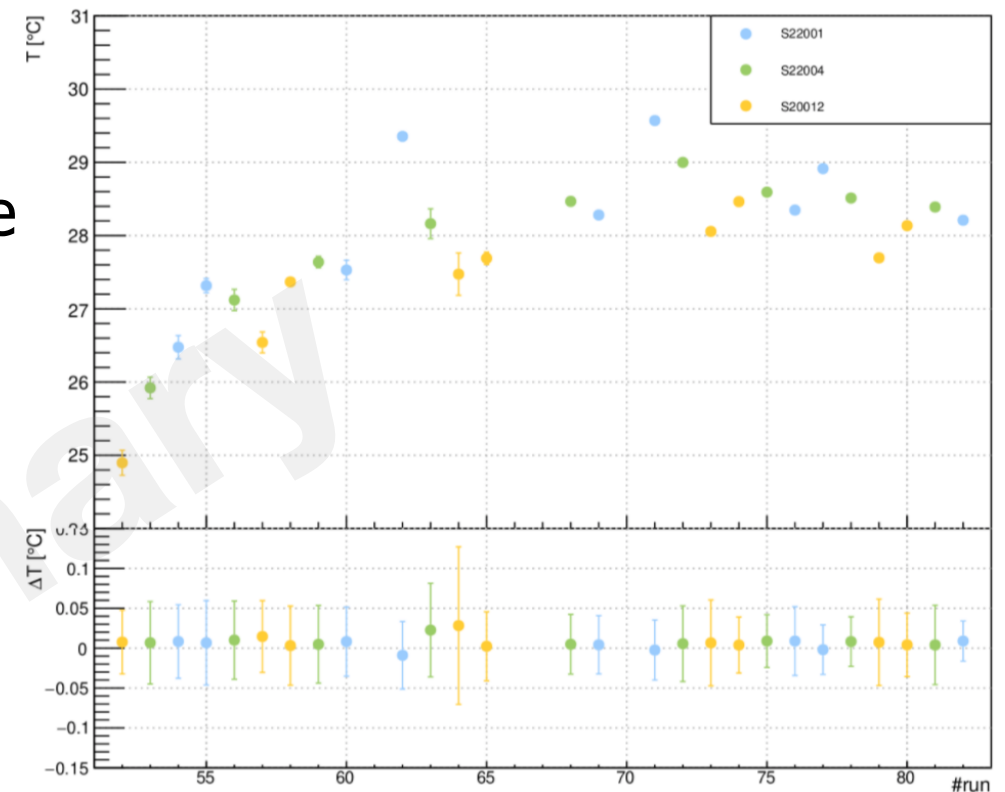
TRANSVERSE SCAN (FIRST NIGHT)



SiPM temperature

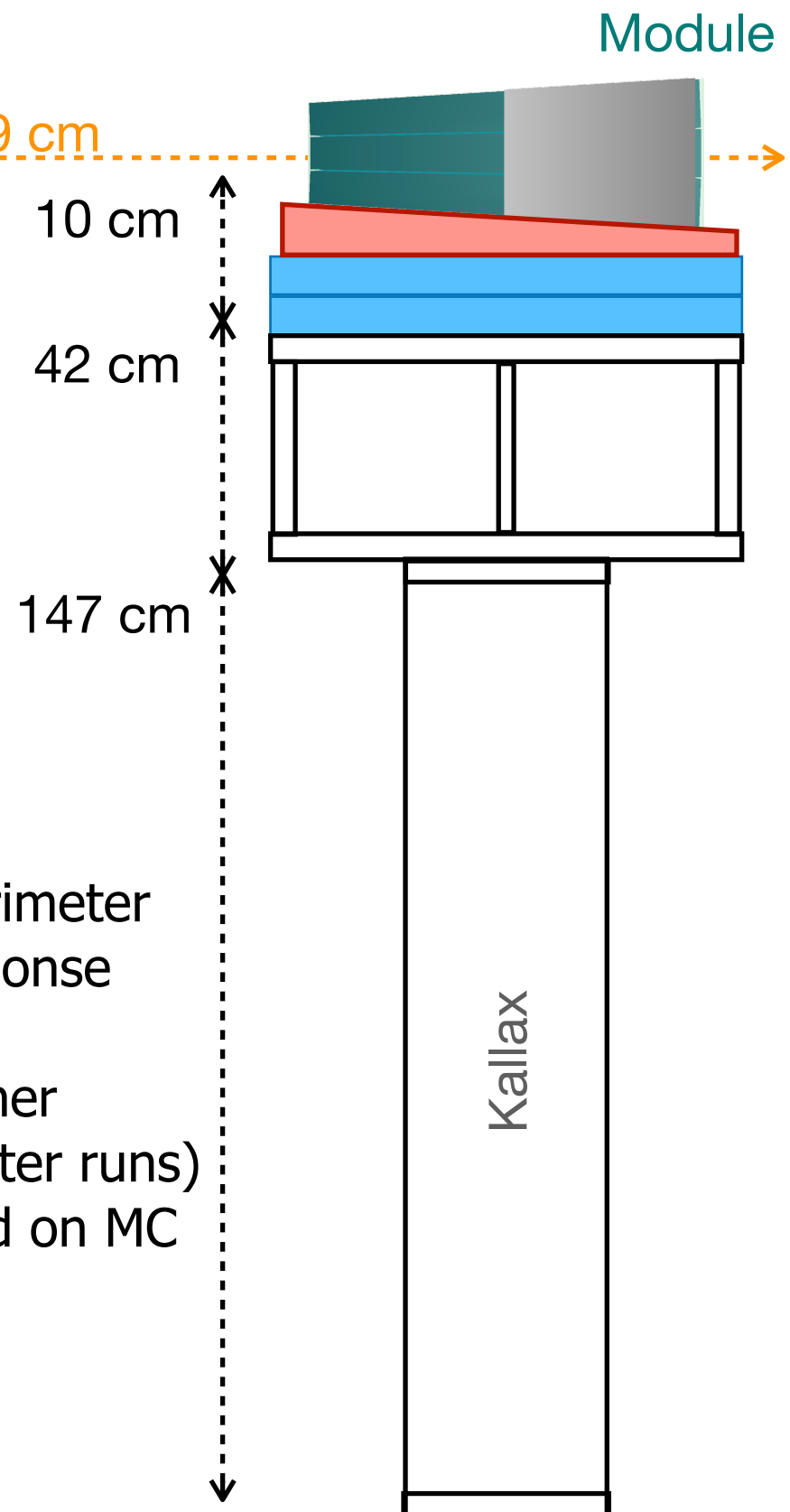
Signal amplitude
(no T correction)

ENERGY SCAN (SECOND NIGHT)



- Calorimeter experts: Nazar & Lorenzo
- Calorimeter setup: one Module (9 crystals)
- Continuous temperature monitoring (separate PC + Arduino)
- Mechanics: 2 kallax from ikea + supports for the Module

beam line: 199 cm



Measurements to do @200-400 MeV/A ^{16}O :

- **optimal case:** no detectors/target upstream the calorimeter (calorimeter can be moved upstream in ≤ 10 minutes) crucial for calibrating response across p/ ^{12}C / ^{16}O and ensuring its linearity
- **suboptimal case:** no target upstream the calorimeter, keeping other detectors in place (if no beam time available for dedicated calorimeter runs) will need to subtract energy deposition in upstream detectors based on MC simulation $\rightarrow$ degraded energy resolution
- **default case:** full apparatus in place (all detectors + target)