# Status of the software of the RICH stand alone simulation

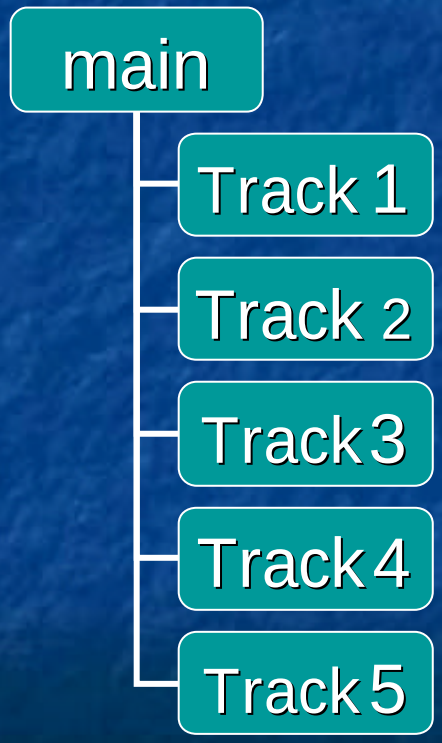
Ntuple description

And status of data production

# Ntuple format

- The ß and Z reconstruction is called 5 times
- The relative quantities cumputed with the reconstruction are arrays:
- Probkl_tk(5)
- npexp_tk(5)
- Cnpe_tk(5)

Each track is associated to a detector or a measurement procedure



# Type of tracks

- Track 1: by the chamber 1
- Track 2: by the chamber 2
- Track 3: by the algorithm of fit to a circle on the detection plane
- Track 4: the position of the RICH pixel with highest charge
- Track 5: a fixed point (x,y) for each run

(computed from track 3)

In any case the beam is assumed to be orthogonal to the detection plane

# RICH external detectors

- Wire Chambers: calibration by F.Barao for proton runs

For Runs with angle: calibration of protons and then alignement with RICH ref. system

- Scintillators: current calibration by C.Delgado

# Independent external detectors

As a future perspective

The use of a common event number will allow

- Correlation with TOF data: information about charge
- Correlation with TRACKER data: information about track position, divergence and particle charge

(see N. Sevilla talk)

The information will be included as new variables in the RICH ntuple

# PMt calibration

- Gain and s(G) is from LED RAW run 611
- pedestal position, width and channel status : from the closest pedestal run during data taking
  - 536 (runs of scan 538-546)
  - 501 (runs of angle 510-519)
  - 611 (protons 618-622)

  Moreover for runs of scan the pedestal positions have been corrected for each run

(more details in C.Palomares talk)

# Data processed up to now

Main objective: to have a complete characterization of the radiator CIN 1.03, that is

- Scan of radiator tile to test the uniformity
- Study of photon yield vs angle

Moreover:

- Runs of MNN and CIN1.03 with same expansion distance (612-613)
- Indium (639)
- Mirror (584-587) in progress
- Protons (618-622)

# Next runs to be processed

- Full characterization radiator MNN 1.03 with runs of  scan and runs with angle

→ Comparison of radiator CIN and MNN with same refractive index

•The same study for radiator CIN 1.04 and CIN 1.05

•Runs of NaF

•Runs with mirror

| Run # | Events | Radiator | H (cm) | Particle | Run type | Angle | Rad Pos | RICH Status | Scintillator Status | Cerenkov Status | WCH Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1000 | 2066 | | | | PEDESTAL | | | | | | |
| 1001 | 7319 | | | | LED RAW | | | | | | |
| 1002 | ~1400 | | | | LED Reduced | | | | | | |
| 500 | 3032 | | | | PEDESTAL | | | | | | |
| 501 | 4037 | | | | PEDESTAL | | | | | | |
| 502 | 92236 | | | | LED Reduced | | | | | | |
| 503 | 201458 | NN103 | 42,3 | A/Z=2 | | 0 | - | | | | |
| 504 | 100958 | NN103 | 42,3 | A/Z=2 | | 0 | - | | hv ( 1500/1900); attjan 6/10; dyn -6) | | HV1 2900 HV2 2600 |
| 505 | 101089 | N103 | 42,3 | A/Z=2 | | 0 | - | | | | |
| 506 | 112026 | MNN103 | 42,3 | A/Z=2 | | 0 | - | | | | |
| 507 | 108845 | MNN1035 | 42,3 | A/Z=2 | | 0 | - | 1st Kapton problem | | | |
| 508 | 103349 | N105 | 42,3 | A/Z=2 | | 0 | - | | | | |
| 509 | 104210 | N104 | 42,3 | A/Z=2 | | 0 | - | | | | |
| 510 | 105127 | N103G | 42,3 | A/Z=2 | | 0 | - | | | | |
| 511 | 105213 | MNN103 | 42,3 | A/Z=2 | Angle | 5 | - | | | | |
| 512 | 53951 | MNN103 | 42,3 | A/Z=2 | Angle | 10 | - | Radiator out of the beam (BAD RUN) | att (16/19) | | |
| 513 | 105073 | MNN103 | 42,3 | A/Z=2 | Angle | 10 | - | | | | |
| 514 | 100072 | MNN103 | 42,3 | A/Z=2 | Angle | 15 | - | | | | |
| 515 | 95828 | MNN103 | 42,3 | A/Z=2 | Angle | 20 | - | | | | |
| 516 | 101401 | N103G | 42,3 | A/Z=2 | Angle | 5 | - | | | | |
| 517 | 104901 | N103G | 42,3 | A/Z=2 | Angle | 10 | - | | | | |
| 518 | 104285 | N103G | 42,3 | A/Z=2 | Angle | 15 | - | | | | |
| 519 | 115146 | N103G | 42,3 | A/Z=2 | Angle | 20 | - | | | | |
| 520 | 71855 | N105 | 42,3 | A/Z=2 | Angle | 15 | - | Ring not full/ contained | | | |
| 521 | 114917 | N105 | 36,5 | A/Z=2 | Angle | 15 | - | | | | |
| 522 | 110550 | N105 | 36,5 | A/Z=2 | Angle | 10 | - | | | | |
| 523 | 105392 | N105 | 36,5 | A/Z=2 | Angle | 5 | - | | | | |
| 524 | 6141 | | | | PEDESTAL | | | LOADED DSP | | | |
| 525 | 101593 | MNN103 | 42,3 | A/Z=2 | Scan | 0 | 3,5/-3,5 | | | | |
| 526 | 101521 | MNN103 | 42,3 | A/Z=2 | Scan | 0 | 3,5/0 | | | | |
| 527 | 94755 | MNN103 | 42,3 | A/Z=2 | Scan | 0 | 3,5/3,5 | | | | |
| 528 | 4240 | | | | PEDESTAL | | | LOADED DSP | | | |
| 529 | 101812 | MNN103 | 42,3 | A/Z=2 | Scan | 0 | 0/3,5 | | | | |
| 530 | 105955 | MNN103 | 42,3 | A/Z=2 | Scan | 0 | -3,5/3,5 | | | | |
| 531 | 94156 | MNN103 | 42,3 | A/Z=2 | Scan | 0 | -3,5/0 | | | | |
| 532 | 97264 | MNN103 | 42,3 | A/Z=2 | Scan | 0 | -3,5/-3,5 | | | | |
| 533 | 99033 | MNN103 | 42,3 | A/Z=2 | Scan | 0 | 0/-3,5 | | | | |
| 534 | 110434 | MNN103 | 42,3 | A/Z=2 | Jorge | 0/-10 | - | 42,3 (+X) 44,4 (-X) | | | |
| 535 | 100239 | MNN103 | 42,3 | A/Z=2 | Jorge | 10/0 | - | | | | |
| 536 | 7076 | | | | PED | | | LOADED DSP | | | |
| 537 | 100697 | | | | LED Reduced | | | | | | |
| 538 | 101903 | N103G | 42,3 | A/Z=2 | Scan | 0 | -2,5/2,5 | | | | |
| 539 | 102100 | N103G | 42,3 | A/Z=2 | Scan | 0 | 0/2,5 | | | | |
| 540 | 107446 | N103G | 42,3 | A/Z=2 | Scan | 0 | 2,5/2,5 | | | | |
| 541 | 112301 | N103G | 42,3 | A/Z=2 | Scan | 0 | -2,5/50 | | | | |
| 542 | 101502 | N103G | 42,3 | A/Z=2 | Scan | 0 | -2,5/0 | | | | |
| 543 | 116055 | N103G | 42,3 | A/Z=2 | Scan | 0 | 2,5/0 | | | | |
| 544 | 87846 | N103G | 42,3 | A/Z=2 | Scan | 0 | -2,5/-2,5 | | | | |
| 545 | 110154 | N103G | 42,3 | A/Z=2 | Scan | 0 | 0/-2,5 | | | | |
| 546 | 103570 | N103G | 42,3 | A/Z=2 | Scan | 0 | 2,5/-2,5 | | | | |
| 547 | 101199 | N105 | 35,6 | A/Z=2 | Scan | 0 | -1,5/1,5 | | | | |
| 548 | 100007 | N105 | 35,6 | A/Z=2 | Scan | 0 | 0/1,5 | | | | |
| 549 | 100929 | N105 | 35,6 | A/Z=2 | Scan | 0 | 1,5/1,5 | | | | |
| 550 | 103510 | N105 | 35,6 | A/Z=2 | Scan | 0 | 1,5/0 | | | | |
| 551 | 101719 | N105 | 35,6 | A/Z=2 | Scan | 0 | 1,5/-1,5 | Half ring | | | |
| 552 | 100323 | N105 | 35,6 | A/Z=2 | Scan | 0 | 0/-1,5 | Half ring | | | |
| 553 | 100827 | N105 | 35,6 | A/Z=2 | Scan | 0 | -1,5/-1,5 | Half ring | | | |
| 554 | 100852 | N105 | 35,6 | A/Z=2 | Scan | 0 | -1,5/0 | | | | |
| 555 | 39778 | NaF | 7,8 | A/Z=2 | Angle | 0 | - | | | | |
| 556 | 63762 | NaF | 7,8 | A/Z=2 | Angle | 0 | - | | | | |
| 557 | 100620 | NaF | 7,8 | A/Z=2 | Angle | 0 | - | | | | |
| 558 | 7024 | | | | PEDESTAL | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 559 | 95373 | | | | LED Reduced | | | | | |
| 560 | 97566 | | | | LED Reduced | | | more light | | |
| 561 | 114328 | NaF | 7,8 | A/Z=2 | Angle | 5 | 0,8 / 0 | | | |
| 562 | 95878 | NaF | 7,8 | A/Z=2 | Angle | 10 | 1,5 / 0 | | | |
| 563 | 10271 | NaF | 7,8 | A/Z=2 | Angle | 15 | 2 / 0 | | | |
| 564 | 101811 | NaF | 7,8 | A/Z=2 | Angle | 15 | 2 / 0 | | | |
| 565 | 135416 | NaF | 7,8 | A/Z=2 | Angle | 20 | - | | | |
| 566 | 40877 | NaF | 7,8 | A/Z=2 | mirror | 0 | | half rings (BAD RUN) | | |
| 567 | 82101 | NaF | 7,8 | A/Z=2 | mirror | 5 | | half rings (BAD RUN) | | |
| 568 | 18659 | NaF | 33 | A/Z=2 | mirror | 0 | | No rings (BAD RUN) | | |
| 569 | 46512 | N 105 | 43,2 | A/Z=2 | mirror | 0 | | | | |
| 570 | 14053 | N 105 | 36,7 | A/Z=2 | mirror | 0 | | | | |
| 571 | 95467 | N 105 | 36,7 | A/Z=2 | mirror | 10 | | | | |
| 572 | 49057 | N 105 | 36,7 | A/Z=2 | mirror | 15 | | | | |
| 573 | 20396 | MNN103 | 36,7 | A/Z=2 | mirror | 15 | | No reflected photons. Ring contained | | |
| 574 | 14487 | MNN103 | 43,2 | A/Z=2 | mirror | 10 | | No reflected photons. Ring contained | | |
| 575 | 100894 | N 105 | 43,2 | A/Z=2 | mirror | 15 | | move mirror | >>>>>>>>> | |
| 576 | 39628 | MN 105 | 43,2 | A/Z=2 | mirror | 20 | | move mirror | >>>>>>>>> | |
| 577 | 2122 | | | | PEDESTAL | | | | >>>>>>>>> | |
| 578 | 102128 | MN 105 | 43,2 | A/Z=2 | mirror | 20 | | as 576 | >>>>>>>>> | |
| 579 | 101238 | MN 105 | 43,2 | A/Z=2 | mirror | 20 | | as 576 | HV1 -> 1600; att1: 16dB -> 19dB | SCA(2) moved to channel 5 |
| 580 | 101588 | MN 105 | 37,3 | A/Z=2 | mirror | 20 | | | | |
| 581 | 117351 | MN 105 | 37,3 | A/Z=2 | mirror | 15 | | | | |
| 582 | 33189 | MN 105 | 37,3 | A/Z=2 | mirror | 10 | | Peaking time changed. No rings (BAD RUN) | | |
| 583 | 100860 | MN 105 | 37,3 | A/Z=2 | mirror | 10 | | | | |
| 584 | 102395 | MN 105 | 37,3 | A/Z=2 | mirror | 0 | | | | |
| 585 | 100453 | MNN103 | 43,2 | A/Z=2 | mirror | 0 | | | | |
| 586 | 101169 | MNN103 | 43,2 | A/Z=2 | mirror | 10 | | | | |
| 587 | 101143 | MNN103 | 43,2 | A/Z=2 | mirror | 20 | | | | |
| 588 | 104583 | NaF | 7,8 | A/Z=2 | mirror | 0 | 0 / 0 | | | |
| 589 | 100986 | NaF | 7,8 | A/Z=2 | mirror | 5 | -0,7 / 0 | | | |
| 590 | 119112 | NaF | 7,8 | A/Z=2 | mirror | 10 | -1,4 / 0 | | | |
| 591 | 102317 | NaF | 7,8 | A/Z=2 | mirror | -5 | 0,7 / 0 | | | |
| 592 | 104380 | N 105 | 37,3 | A/Z=2 | scan | 0 | 0 / - 1,5 | foam sheets backing the tile ? | | |
| 593 | 101804 | N 105 | 33 | A/Z=2 | scan | 0 | 0 / - 1,5 | foam sheets backing the tile ? | | |
| 594 | 111615 | N 105 | 33 | A/Z=2 | scan | 0 | 1,5 / - 1,5 | foam sheets backing the tile ? | | |
| 595 | 104255 | N 105 | 33 | A/Z=2 | scan | 0 | -1,5 / -1,5 | foam sheets backing the tile ? | | |
| 596 | 2308 | | | | PEDESTAL | | | | | |
| 597 | 92350 | | | | LED Reduce | | | | | |
| 598 | 10477 | | | | LED RAW | | | | | |
| 599 | 205676 | MNN103 | 43,2 | A/Z=2 | | 0 | - | | | |
| 600 | 181109 | MNN103 | 43,2 | A/Z=2.25 | | 0 | - | | | |
| 601 | 103542 | MNN103 | 43,2 | A/Z=2.25 | | 0 | - | | HV (1600 -> 1500 & 1900 -> 1800) | |
| 602 | 68528 | MNN103 | 43,2 | A/Z=2.25 | | 0 | - | | | Anode where it was Dynode |
| 603 | 88618 | MNN103 | 43,2 | A/Z=2.25 | | 0 | - | | | att (+4 dB) |
| 604 | 12040 | MNN103 | 35 | A/Z=2.25 | | 0 | - | 1st Kapton fixed | | att back to 602 settings (6 dB) |
| 605 | 7045 | | | | PEDESTAL | | | | | |
| 606 | 98081 | MNN103 | 35 | A/Z=2.25 | | 0 | - | | | |
| 607 | 113103 | N 105 | 33 | A/Z=2.25 | | 0 | - | LOADED DSP | | |
| 608 | 116677 | N 103? | 33 | A/Z=2.25 | | 0 | - | | | |
| 609 | 120889 | N 103? | 33 | A/Z=2.25 | | 0 | - | | | |
| 610 | 3116 | | | | PEDESTAL | | | | | |
| 611 | 25718 | | | | LED RAW | | | | | |
| 612 | 50769 | N 103? | 33,1 | A/Z=2.25 | | 0 | - | | | att: 3dB, 12dB |
| 613 | 100828 | MNN103 | 33,1 | A/Z=2.25 | | 0 | - | | | |
| 614 | 62812 | N 104 | 33,1 | A/Z=2.25 | | 0 | - | | | |
| 615 | 4500 | N 104 | 33,1 | A/Z=2.35 | | 0 | - | | | |
| 616 | 11978 | N 104 | 33,1 | A/Z=2.35 | | 0 | - | | HV (HV1 -> 1350, HV2 -> 1351) | HVCK = 1900 |
| 617 | 28801 | N 104 | 33,1 | A/Z=2.35 | | 0 | - | | HV (HV1 -> 1500, HV2 -> 1800) | HVCK = 1900 |
| 618 | 101167 | N 103G | 33,1 | A/Z=1 (15 GeV) | | 0 | - | | HV (HV1 -> 1600, HV2 -> 2000) | HV1 -> 2900; HV2 -> 3000) |
| 619 | 122314 | N 103G | 33,1 | A/Z=1 (13 GeV) | | 0 | - | | | |
| 620 | 103512 | N 103G | 33,1 | A/Z=1 (11 GeV) | | 0 | - | | | |
| 621 | 100510 | N 103G | 33,1 | A/Z=1 (9 GeV) | | 0 | - | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 622 | 103463 | N.103G | 33,1 | A/Z=1 (7 GeV) | | 0 | - | | | | |
| 623 | - | N.103G | 33,1 | A/Z=1 (5 GeV) | | 0 | - | BAD RUN | | | |
| 624 | 105251 | N.105 | 33,1 | A/Z=1 (15 GeV) | | 0 | - | | | | |
| 625 | 103495 | N.105 | 33,1 | A/Z=1 (13 GeV) | | 0 | - | | | | |
| 626 | 103355 | N.105 | 33,1 | A/Z=1 (11 GeV) | | 0 | - | | | | |
| 627 | 119162 | N.105 | 33,1 | A/Z=1 (9 GeV) | | 0 | - | | | | |
| 628 | 61220 | N.105 | 33,1 | A/Z=1 (7 GeV) | | 0 | - | | | | |
| 629 | 3958 | | | | PEDESTAL | | | | | | |
| 630 | 107592 | N.105 | 33,1 | A/Z=1 (9 GeV) | | 0 | - | | | | |
| 631 | 26333 | N.105 | 33,1 | A/Z=2.35 | | 0 | - | | HV (HV1 -> 1350, HV2 -> 1350) | | |
| 632 | 42168 | N.105 | 33,1 | A/Z=2.35 | | 0 | - | HV = HV - 50 | | | |
| 632 | 12587 | N.105 | 33,1 | A/Z=2.35 | RAW | 0 | - | | | | |
| 634 | 35419 | N.105 | | | PEDESTAL | | - | LOADED DSP | | | |
| 635 | 10603 | N.105 | | | LED RAW | | - | | | | |
| 636 | 18002 | N.105 | 33,1 | A/Z=2.35 | | 0 | - | | HV (HV1 -> 1500, HV2 -> 1800) | | |
| 637 | 12756 | N.105 | 33,1 | A/Z=2.35 | | 0 | - | | | | |
| 638 | 14295 | N.103 | 33,1 | A/Z=2.35 | | 0 | - | | | | |
| 639 | 108853 | N.103 | 33,1 | A/Z=2.35 | | 0 | - | | | | |
| 640 | 117220 | N.103 | 33,1 | A/Z=2.35 | RAW | 0 | - | | | | |