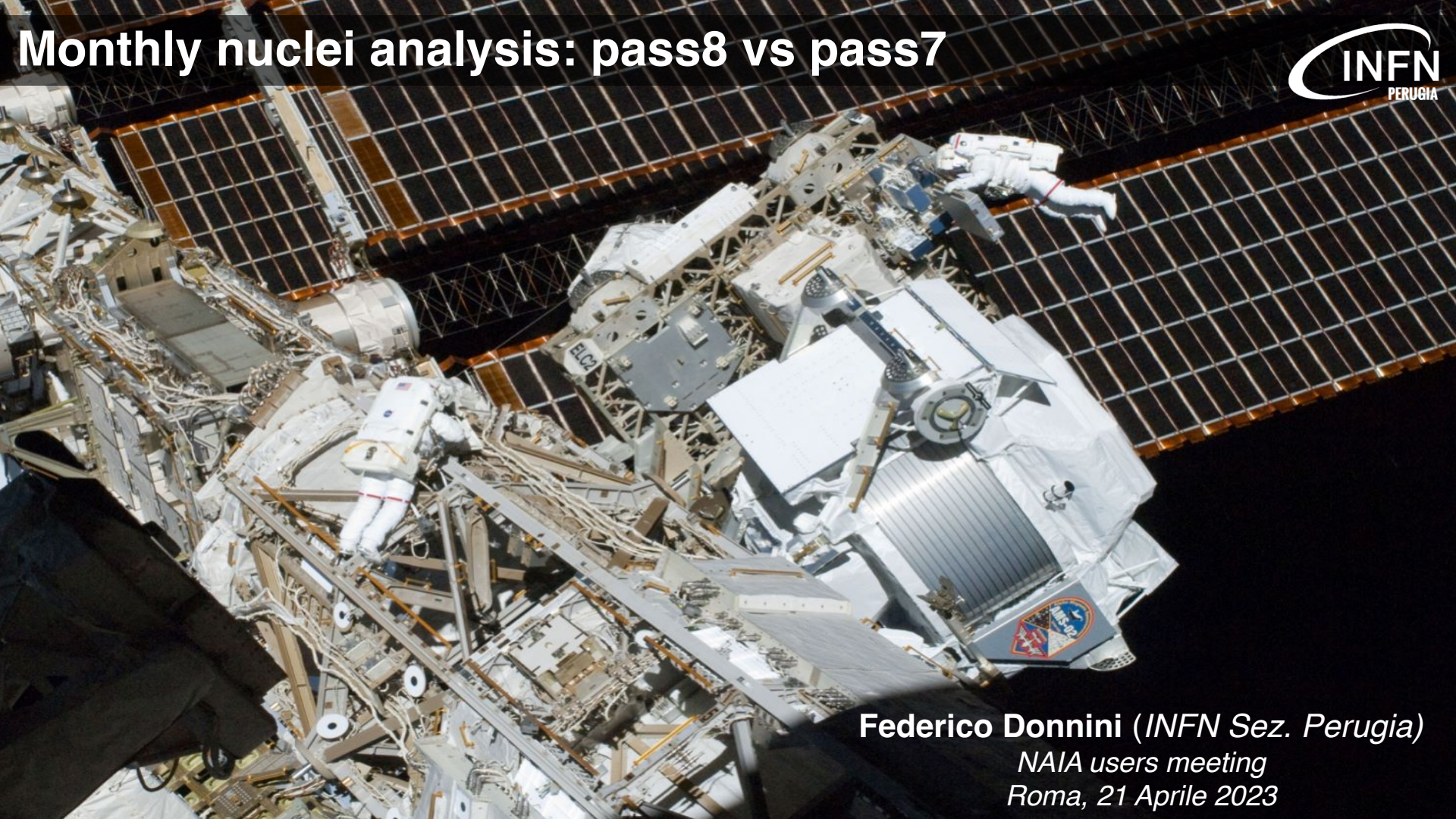


Monthly nuclei analysis: pass8 vs pass7



Federico Donnini (*INFN Sez. Perugia*)
NAIA users meeting
Roma, 21 Aprile 2023

Strategy

Isotropic Differential Flux for each **Bartel Rotation (BR)**, starting from May 2011 up to May 2021(135 Bartels Rotations):

$$\Phi_i^{BR} = \frac{N_i^{BR}}{A_i^{BR} \epsilon_i^{BR} T_i^{BR} \Delta R_i}$$

- ❑ **Isotropic Differential Flux** $(m^2 sr s GV)^{-1}$
- ❑ **Number of events:** PG selections, 10 years of Pass8 Data
- ❑ **Effective Acceptance:** B1236.6_02 (Boron), B1236.6_02 (Carbon), B1236.6_02 (Oxygen)
- ❑ **Trigger Efficiency**
- ❑ **Exposure Time**
- ❑ **Bin width:** bins from 1.9 GV to 60 GV

Pass8: Selected Events (C&O)

BASIC

- No SAA
- Live time > 0.5 && Zenith < 25 with
- Physics trigger

TOF

- $\beta > 0$
- Upper ToF charge Q E (Z - 0.75, Z + 0.75)

INNER

- At least one track with Q E (Z - 0.3, Z + 0.7)
- pattern on Y view: L2 && (3 | | 4) && (5 | | 6) && (7 | | 8)
- Chi2 < 10
- R > 1.2RC (IGRF)
- $\sigma Q/Q < 0.2$

INNERL1

- InnerL1 track with Q E (0, Z + 0.8)
- InnerL1 Chi2 < 10
- L1NormRes < 10
- R > 1.2RC (IGRF)

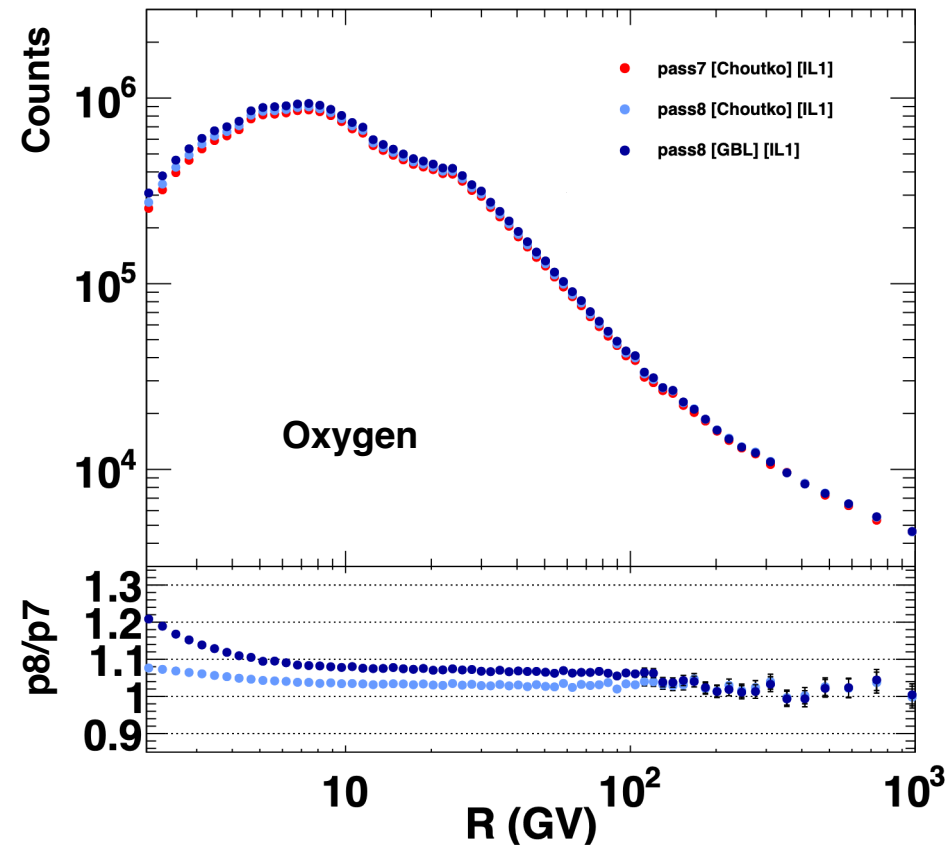
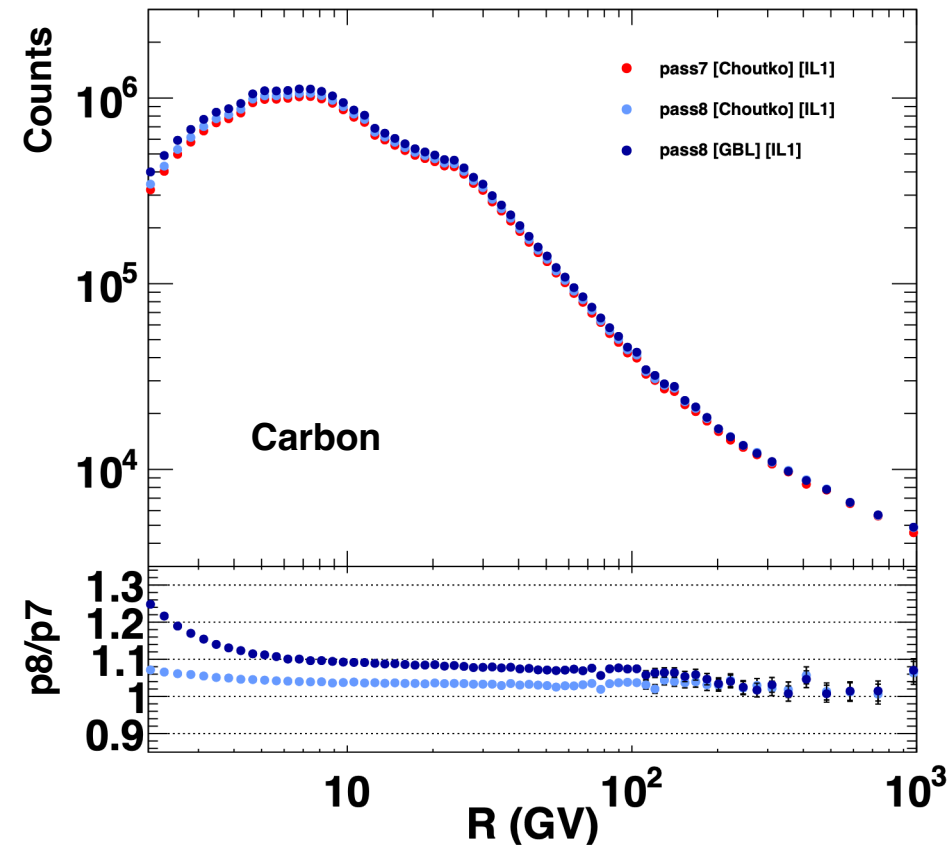
Carbon

Choutko: 22.0 M --> +4% of p7 (21.2 M)
GBL: 23.4 M --> +11% of p7 (21.2 M)

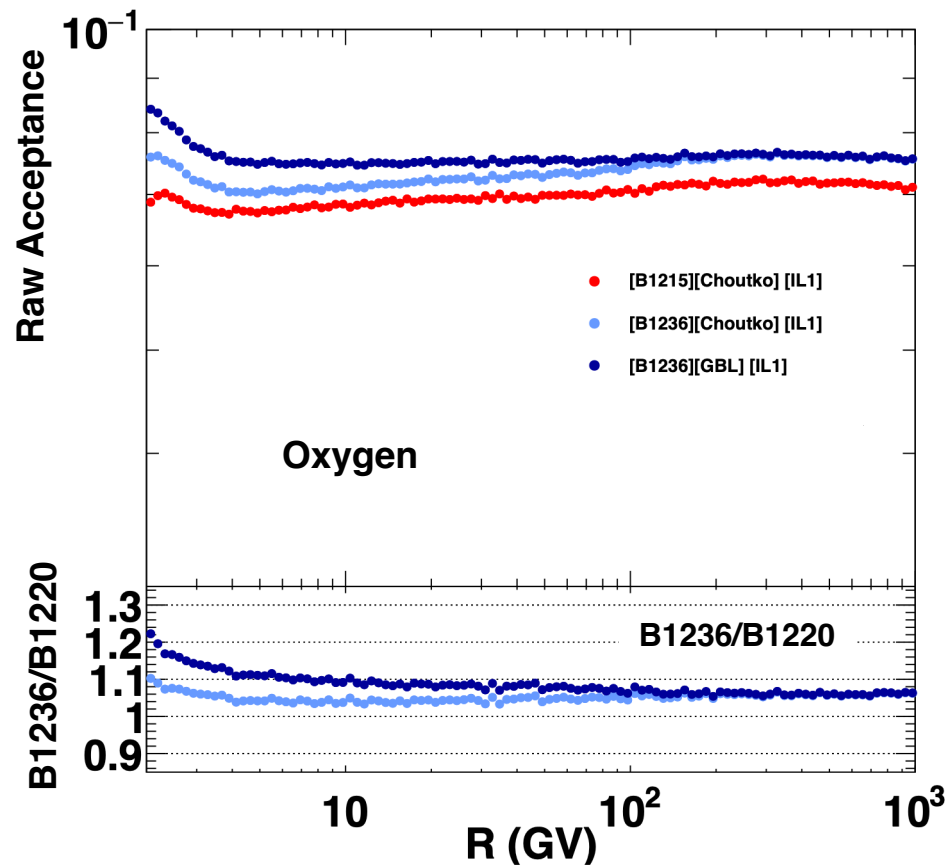
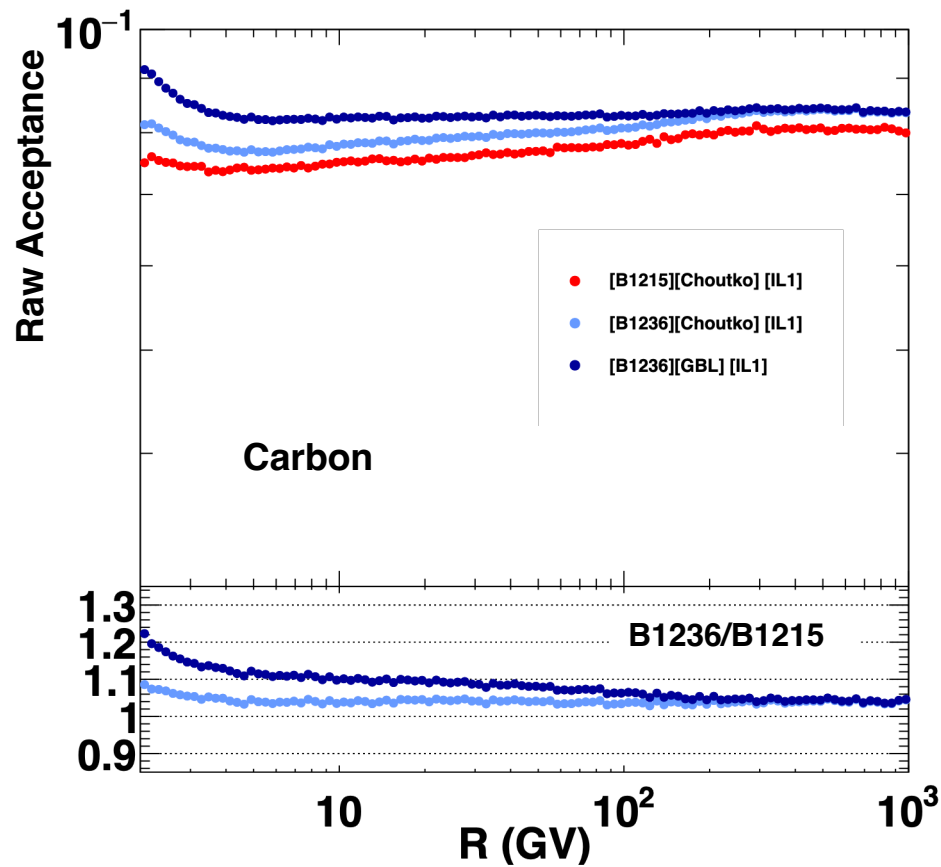
Oxygen

Choutko: 18.9 M --> +4% of p7 (18.3 M)
GBL: 19.8 M --> +9% of p7 (18.3 M)

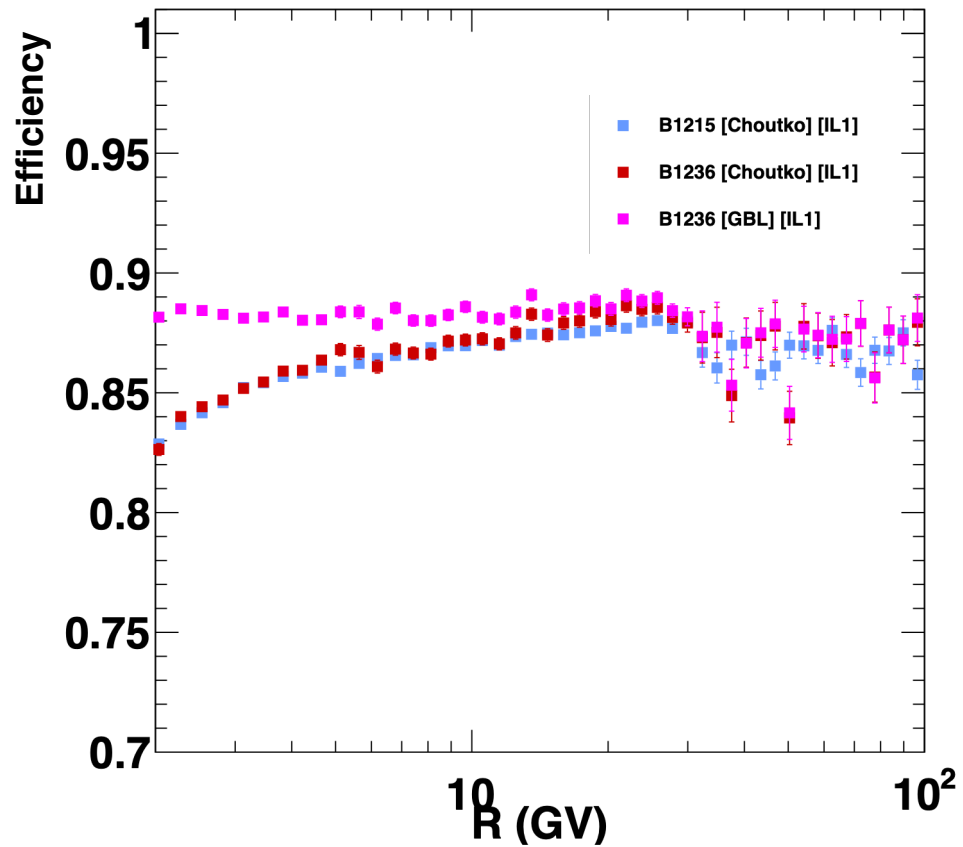
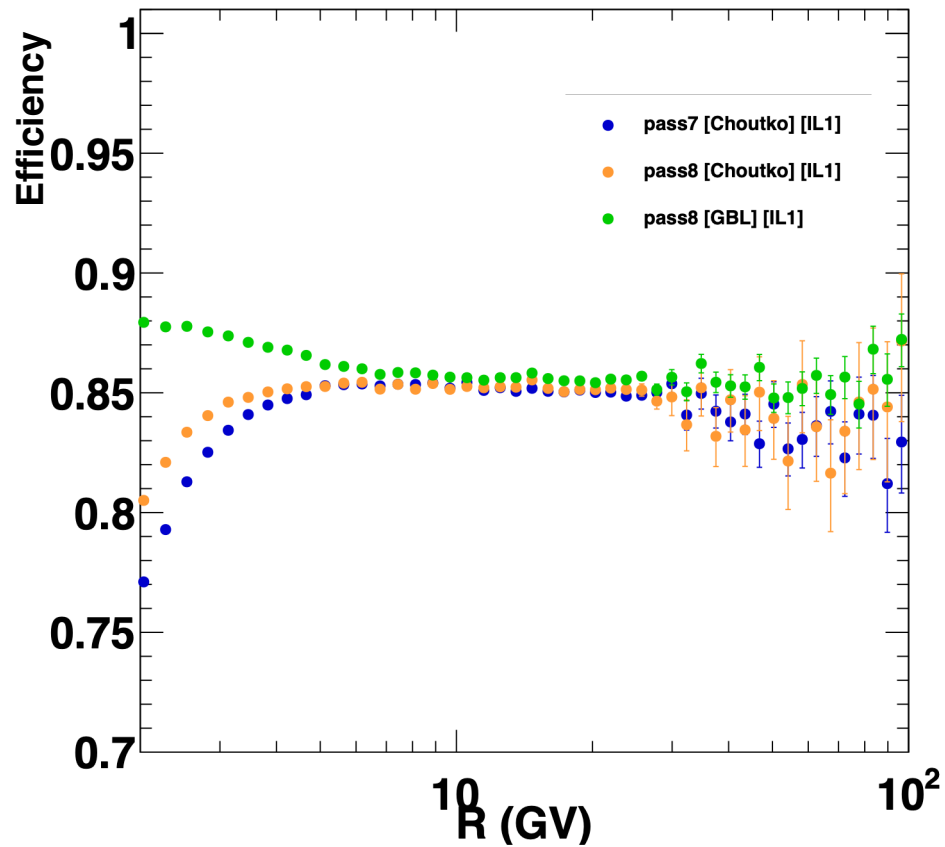
Pass8 vs Pass7: Selected Events (C&O)



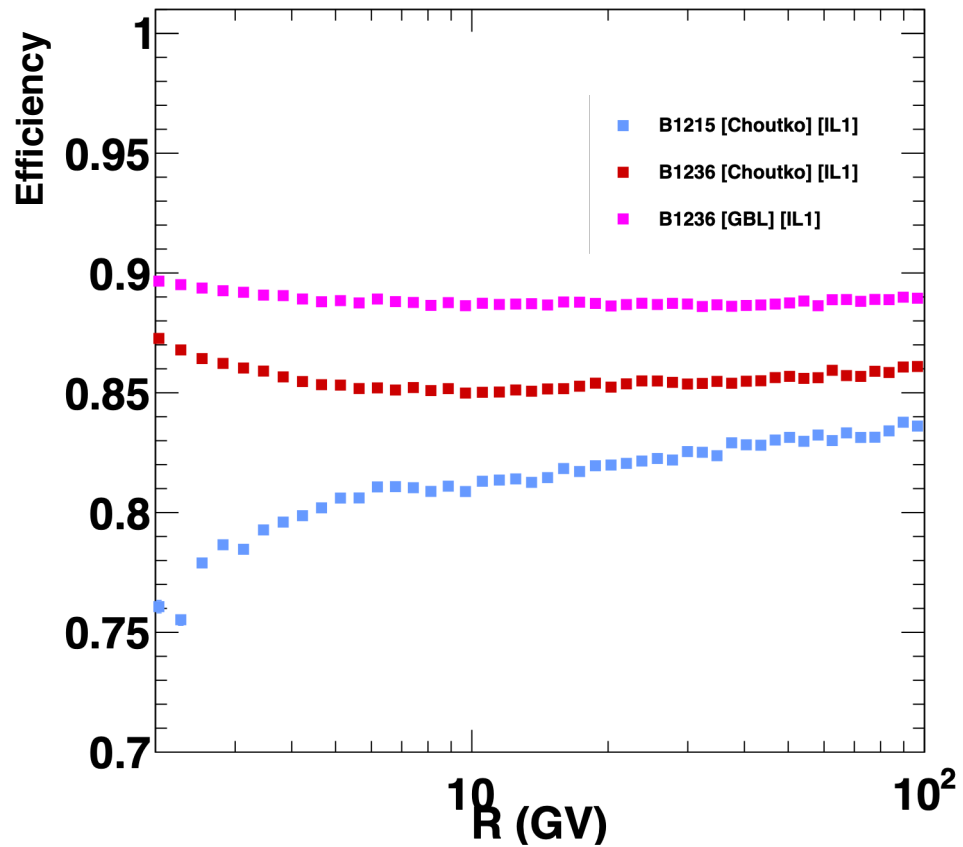
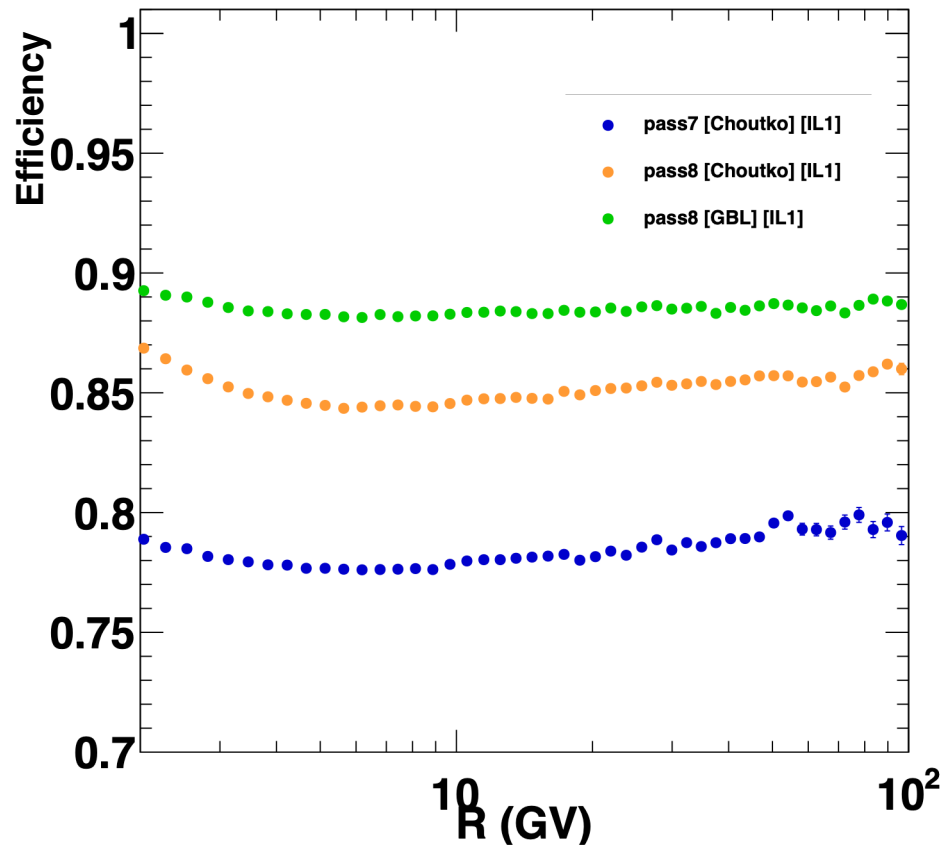
Pass8 vs Pass7: Raw Acceptance (C&O)



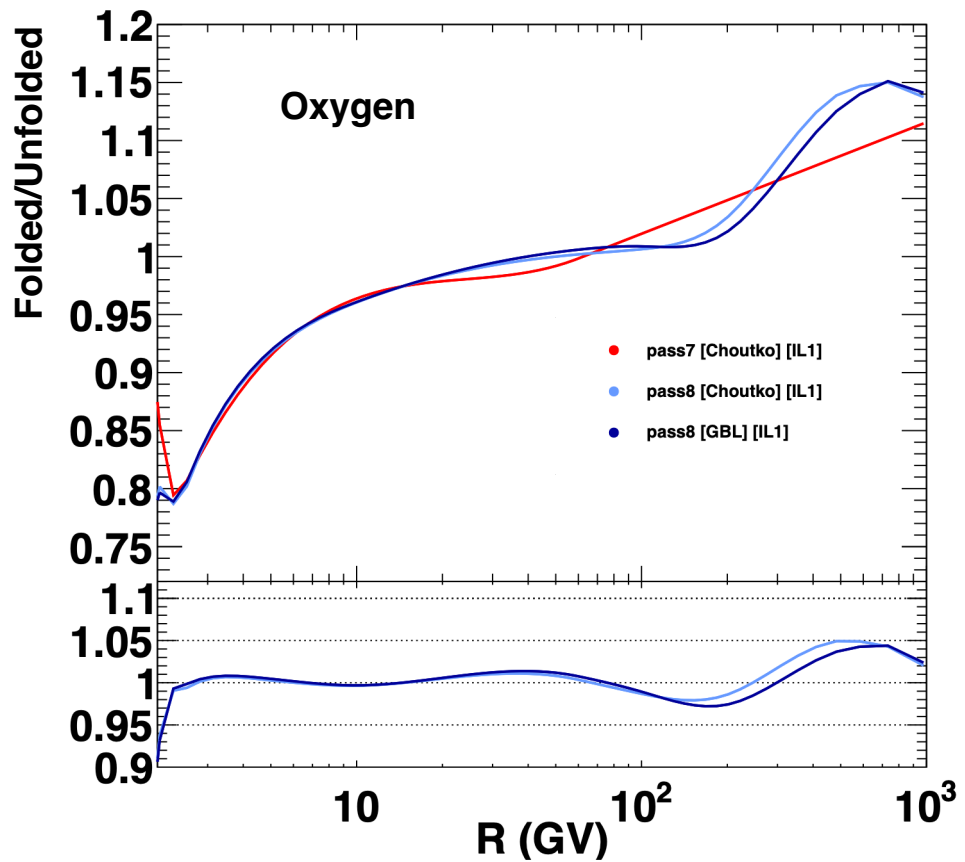
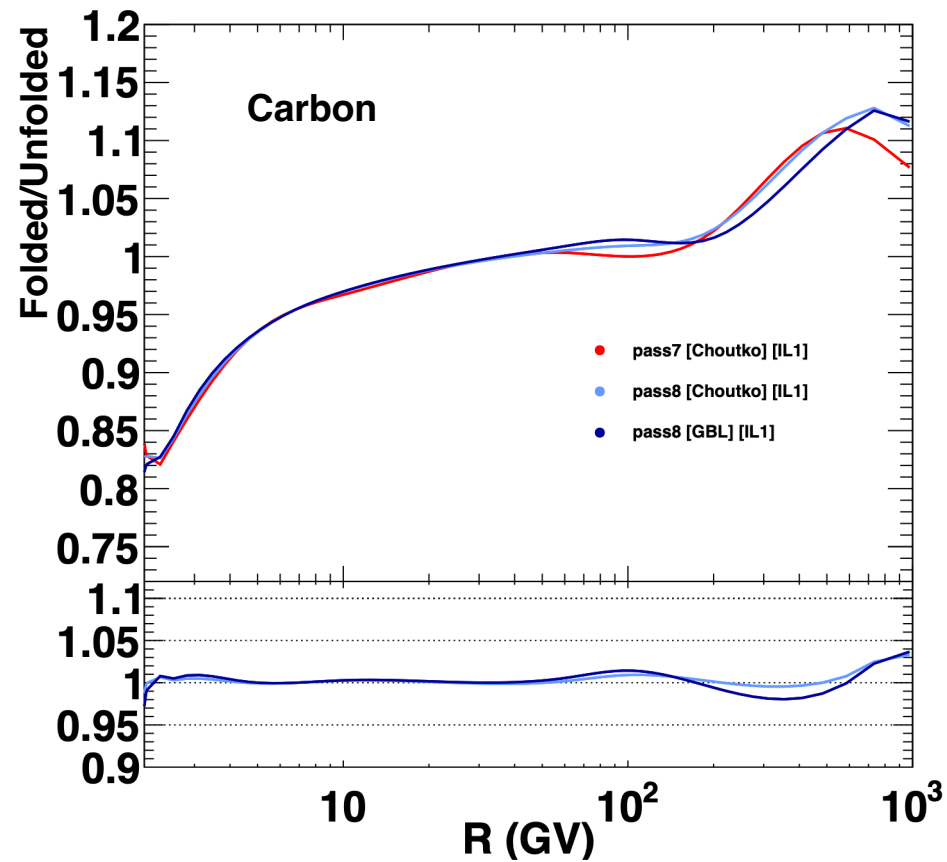
Pass8 vs Pass7: Tracking Efficiency (C)



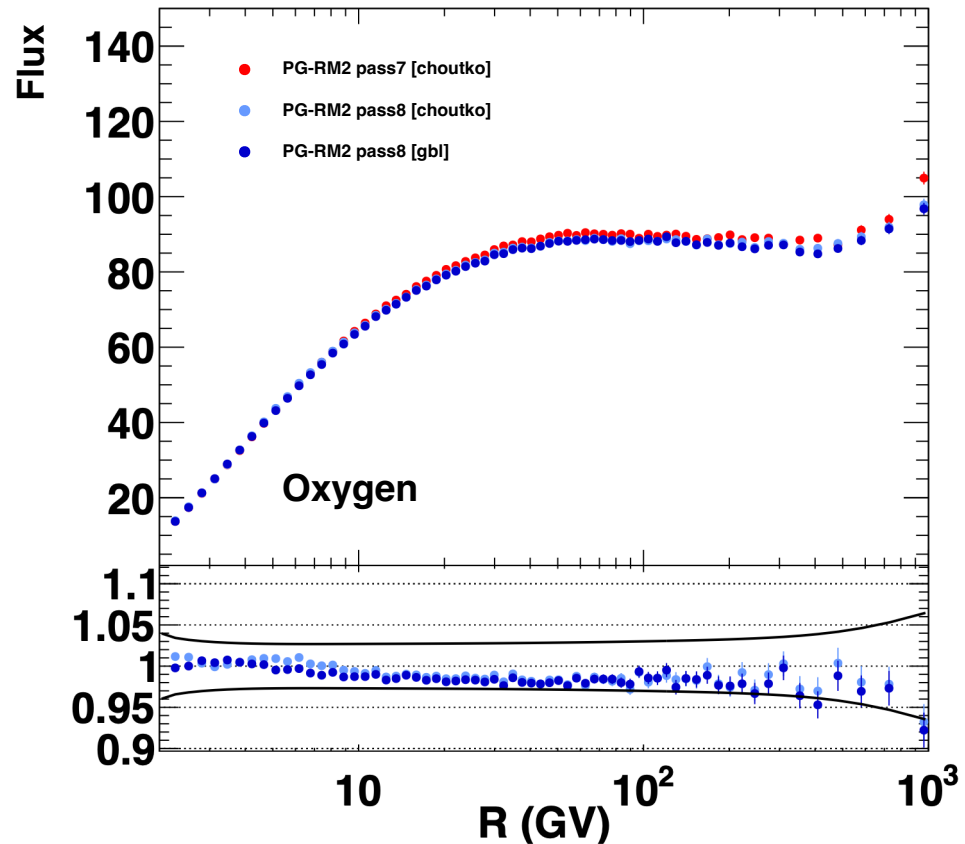
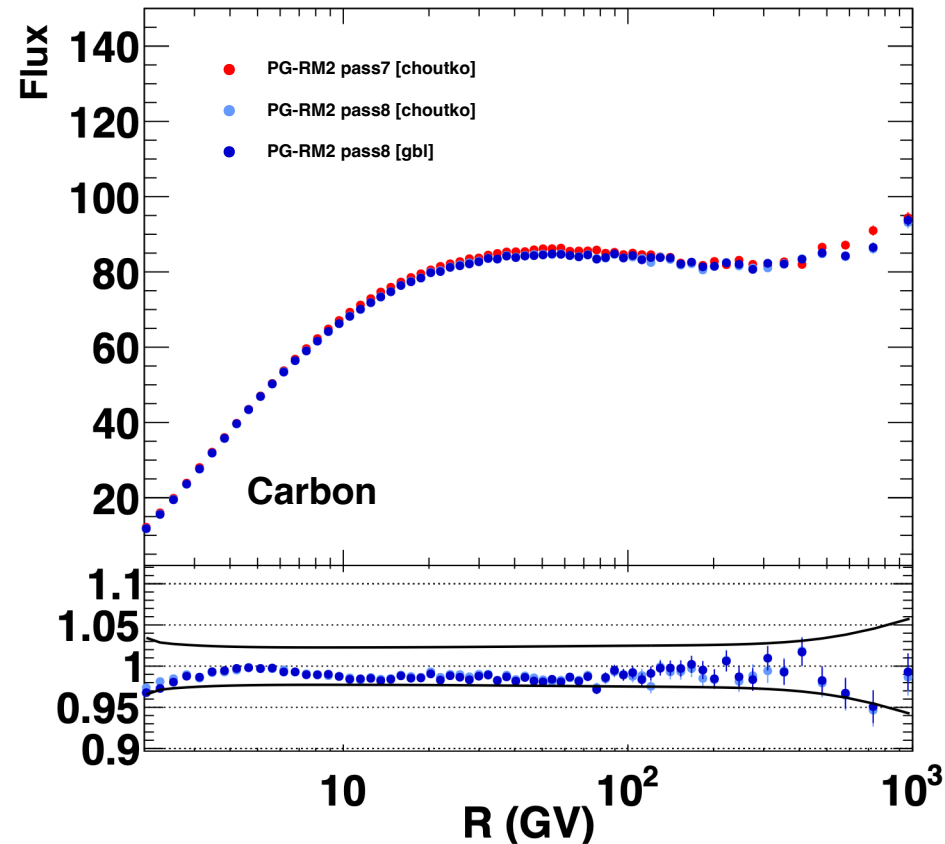
Pass8 vs Pass7: L1 Pickup Efficiency (C)



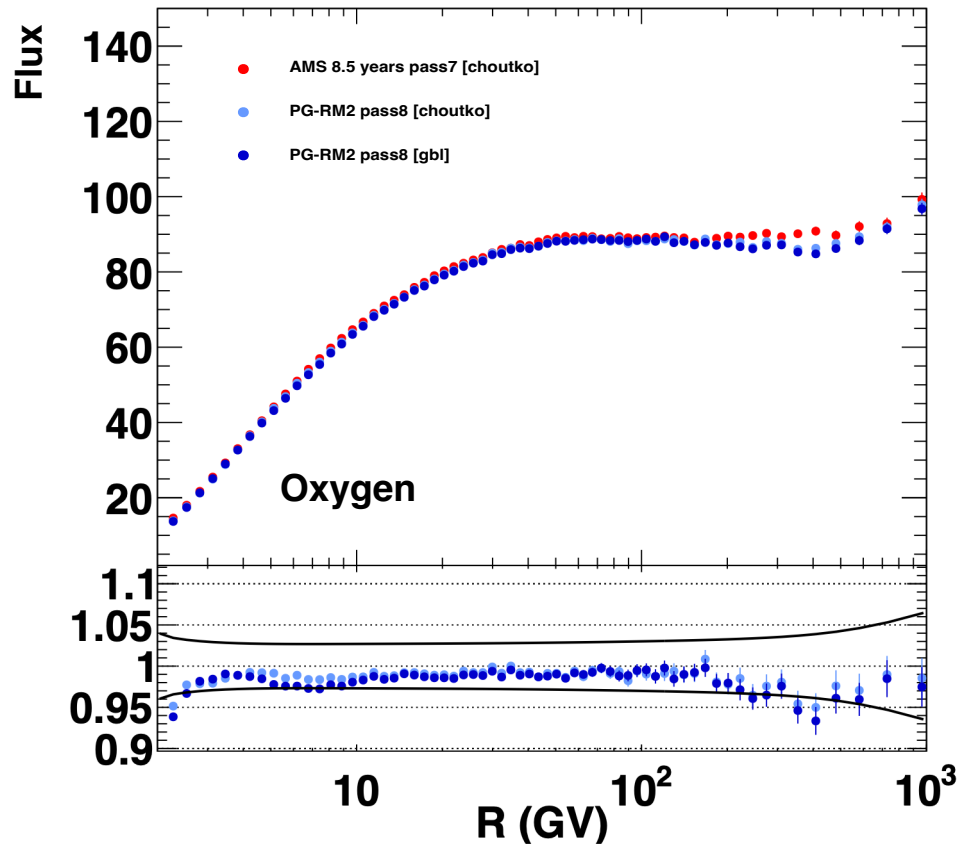
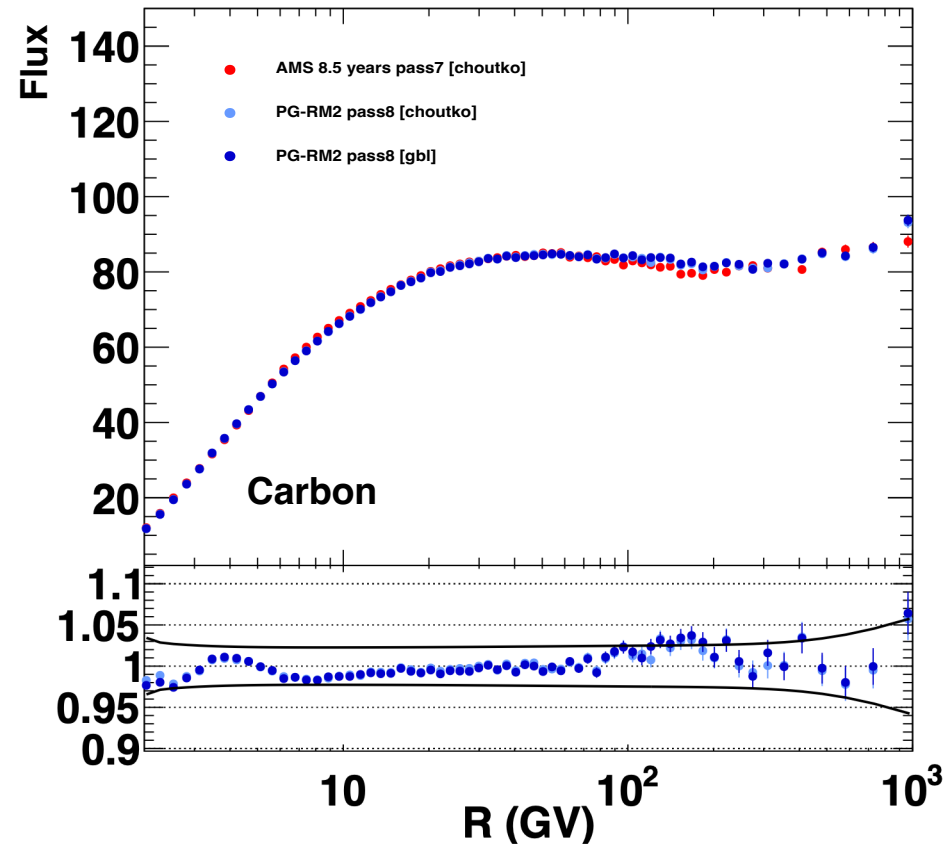
Pass8 vs Pass7: Unfolding Factor (C&O)



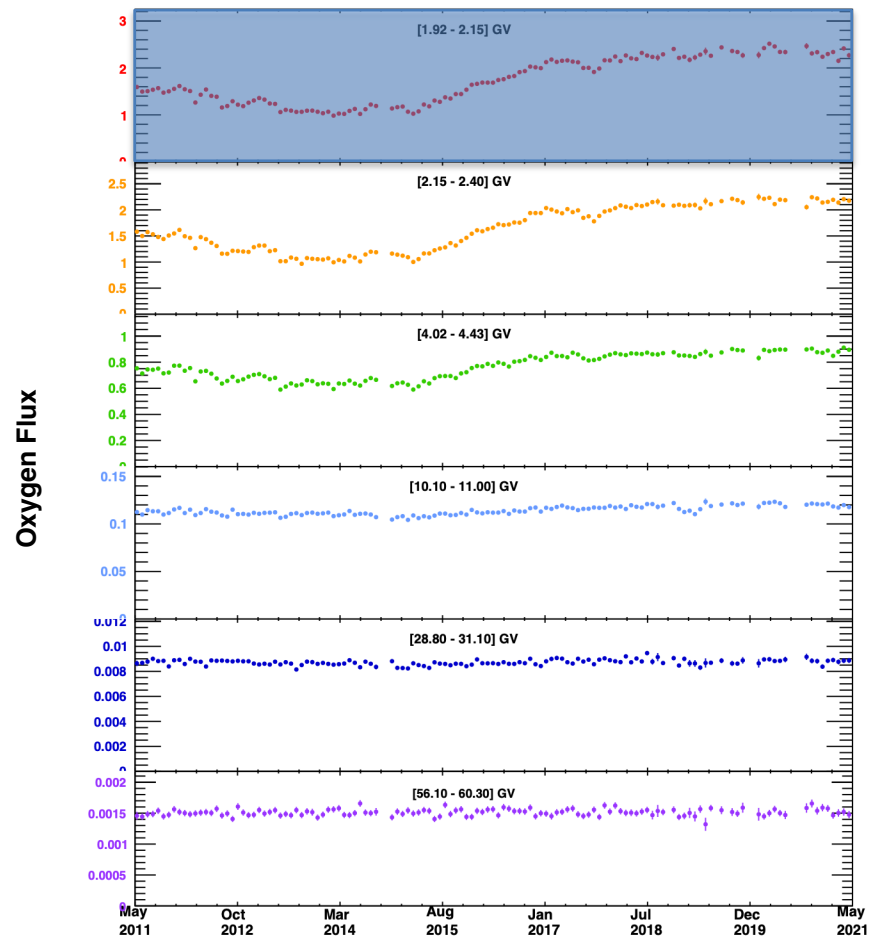
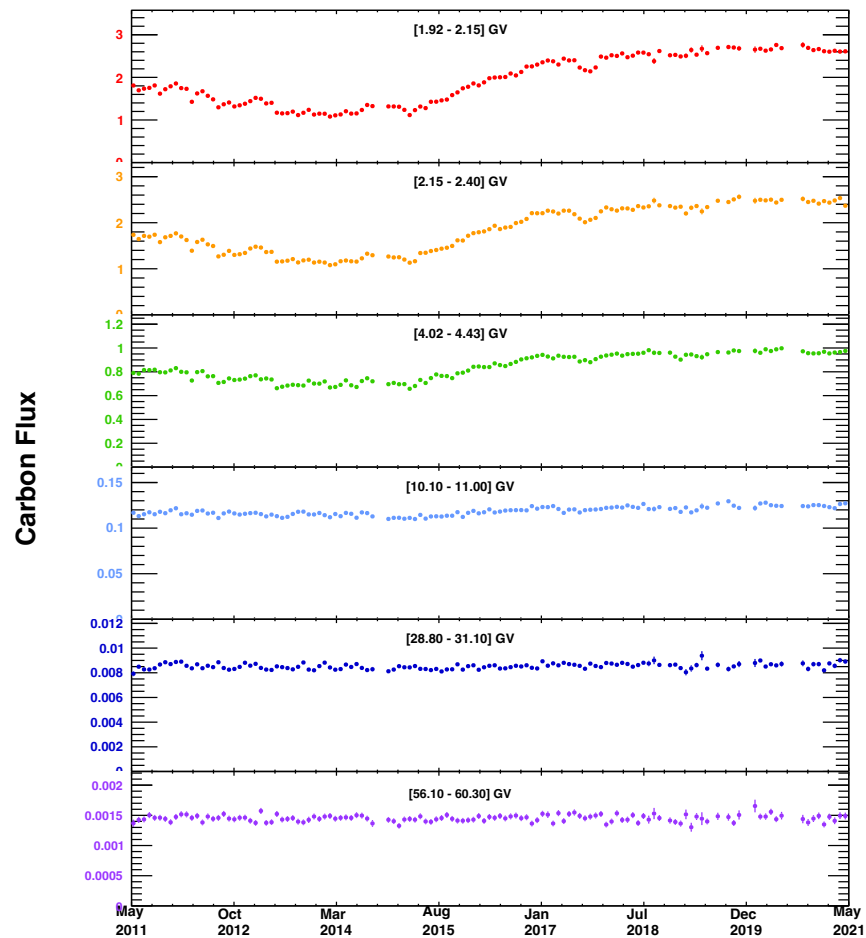
Pass8 vs Pass7: Integrated Flux (C&O)



Pass8 vs Pass7: Integrated Flux (C&O)

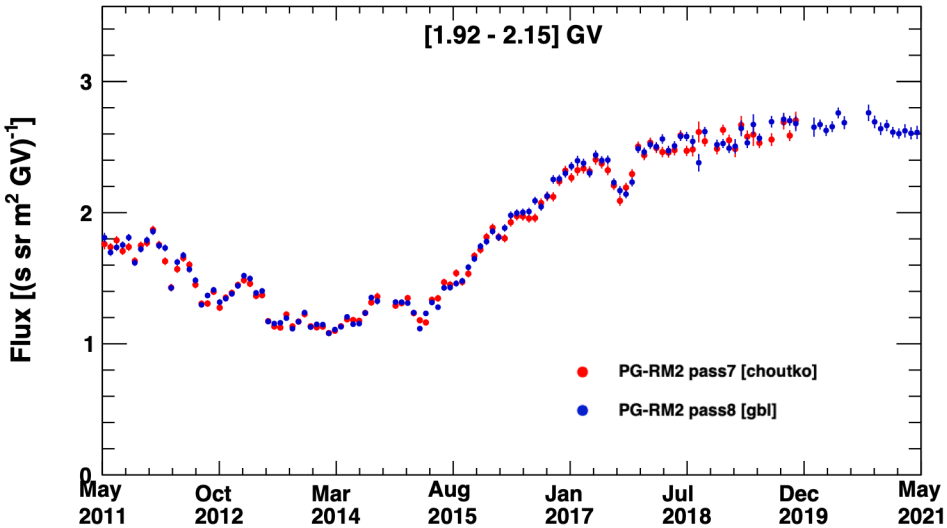


Pass8: Time dependent Flux (C&O)

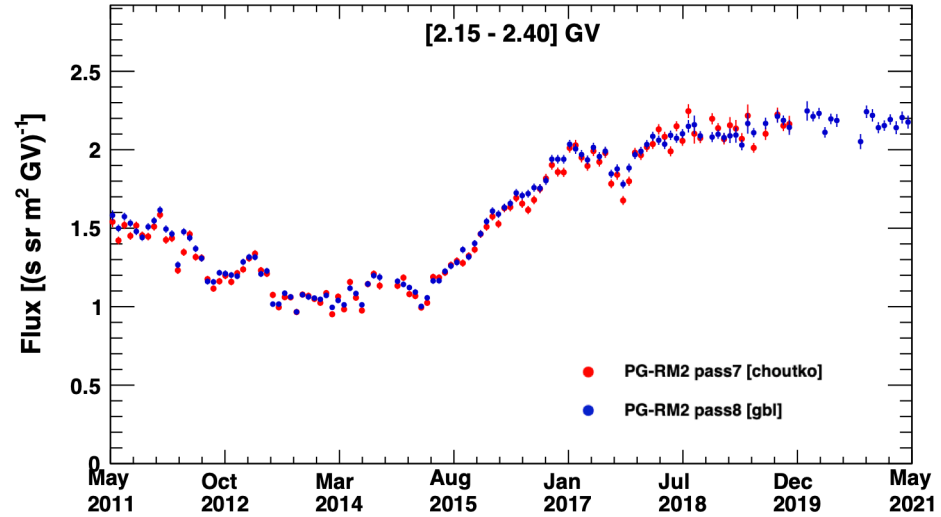


Pass8 vs Pass7: Time dependent Flux (C&O)

Carbon



Oxygen



Conclusion

| | Boron | Carbon | Oxygen |
|----------------|---------|--------|--------|
| Exposure Time | ✓ | ✓ | ✓ |
| Counts | ✓ | ✓ | ✓ |
| Raw Acceptance | ✓ | ✓ | ✓ |
| Efficiencies | ✓ | ✓ | ✓ |
| Acceptance | ✓ | ✓ | ✓ |
| Contamination | ongoing | ✓ | ✓ |
| Unfolding | | ✓ | ✓ |
| Flux | | ✓ | ✓ |