

# A few considerations about future papers (S. Petrera, Oct 19, 2011)

## Reminder:

### New rules for upcoming papers (KHK 08/29/2011)

*“We ask the proponents and the corresponding task-leaders of a paper **to involve the coordinators at an embryonic stage of the paper**, i.e. at a point where just the basic ideas and plans have been worked out. If there is general agreement about the assembly of a paper, a scientific editing team should be formed, composed of*

*\* the basic proponents*

*\* the corresponding task leader and*

*\* one of the coordinators*

*This group in consultation with the PC would appoint another*

*\* senior member of the collaboration*

*to also become a member of the editing team.”*





### *It is now time to plan our future papers:*

*1. Infill Spectrum → Highest Priority, on the way*

*2. A paper including new data (ICRC 2011) +  
astrophysical implications*

*3. other ?*

## Next papers on the spectrum

1. Letter (PL) on the hybrid energy spectrum. The letter will contain a new hybrid spectrum compared to the SD spectrum published on PRL and the combined spectrum as [the Auger spectrum](#). No unfolding. Fits power “gamma” in the three energy regions. *(August 2008 ?)* 
2. Long paper on the experimental methods for the SD spectrum and the hybrid spectrum. [A single long paper](#) on the Auger analysis for the spectrum avoids dispersion of the information and duplication of the presentation. S(1000)+CIC+FD energy calibration + Unfolding Physics discussion (ankle+GZK) *(December 2008 ?)* 
3. Technical paper on hybrid acceptance, FD trigger efficiency etc. *(in time with 2.)* 
4. Technical paper on SD trigger efficiency, event selection, exposure *(in time with 2.)* 

# Energy spectrum with the Surface Detector

## Energy calibration

- The constant integral intensity method and S38
  - Methods for constructing the attenuation curve
    - The counting method
    - Interpolation method
    - Assuming a functional form of the attenuation
  - Systematic uncertainties
- Hybrid Event Selection
  - Systematic uncertainties
    - Fluorescence yield
    - P,T and humidity
    - Effects on yield Calibration
    - Atmosphere
    - Reconstruction
    - Invisible energy
- Correlation of S38 with the FD energy
  - Ellipse cut
  - Non-perpendicular cut
  - Non-linearity of the correlation in lg-lg
- Uncertainties in the calibration procedure
- Additional Tests and Cross-checks

## Energy spectrum

- Uncertainties
- Unfolding
- Combining

## Astrophysical Implications

- Ankle
- Suppression
  - Significance
  - TP statistics
- Elemental composition

# Is this layout still valid?

1. Is a single paper suitable for treating both experimental details and physical interpretation?

Don't know, we should try and eventually split it into two papers

2. Astrophysical interpretations are now in many papers from authors external to Auger. Are we ready/willing to do it ourselves?

Yes. Some analyses already submitted through GAP-notes

3. Can sensible astrophysical implications be derived from spectrum only?

Maybe No. Several studies have shown that the energy spectrum allows for too many solutions...

**But it has also been shown that spectrum+composition constrain astrophysical scenarios:**

S. Riggi, et al, GAP-2011-101, D. Boncioli et al., GAP-2011-064  
(see also A.M. Taylor et al., <http://arxiv.org/abs/0905.0257> )

**My suggestion: a paper updating both spectrum and composition + phys. implications – To be coordinated with Mass comp. Task**