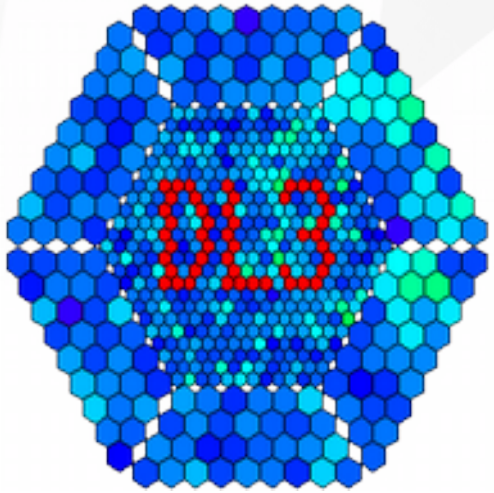


MAGIC DL3 (short) report

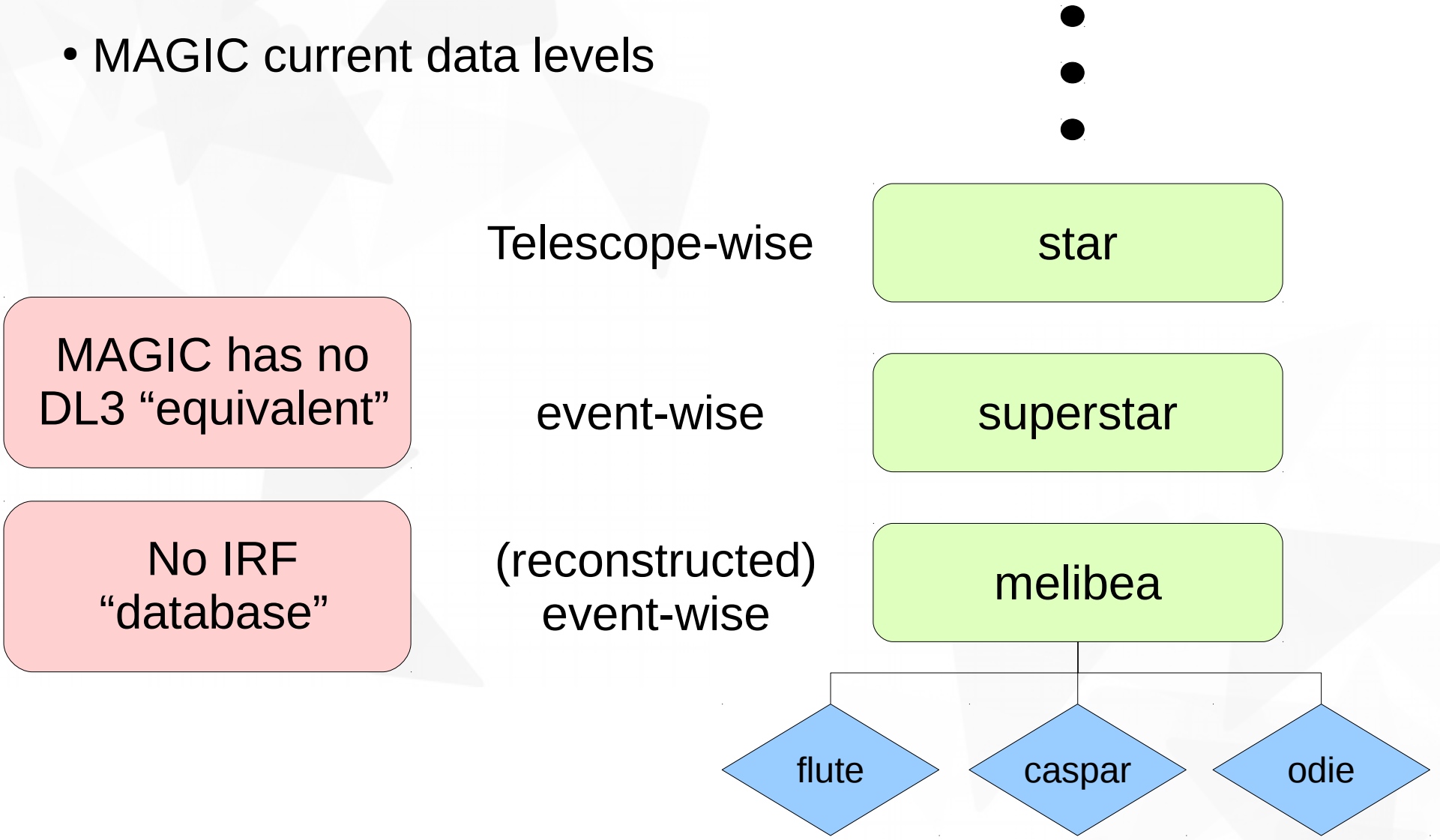
T. Hassan

MAGIC DL3 status

- DL3 production: effort that started very recently
- Main objectives:
  - Testbed for CTA data model (and maybe other ESFRI projects?)
  - Future archive of MAGIC data
  - Share data. Starting to have some multi-experiment projects: LIV team, GW follow ups or HESS J1841 -055
- Still far away from ready

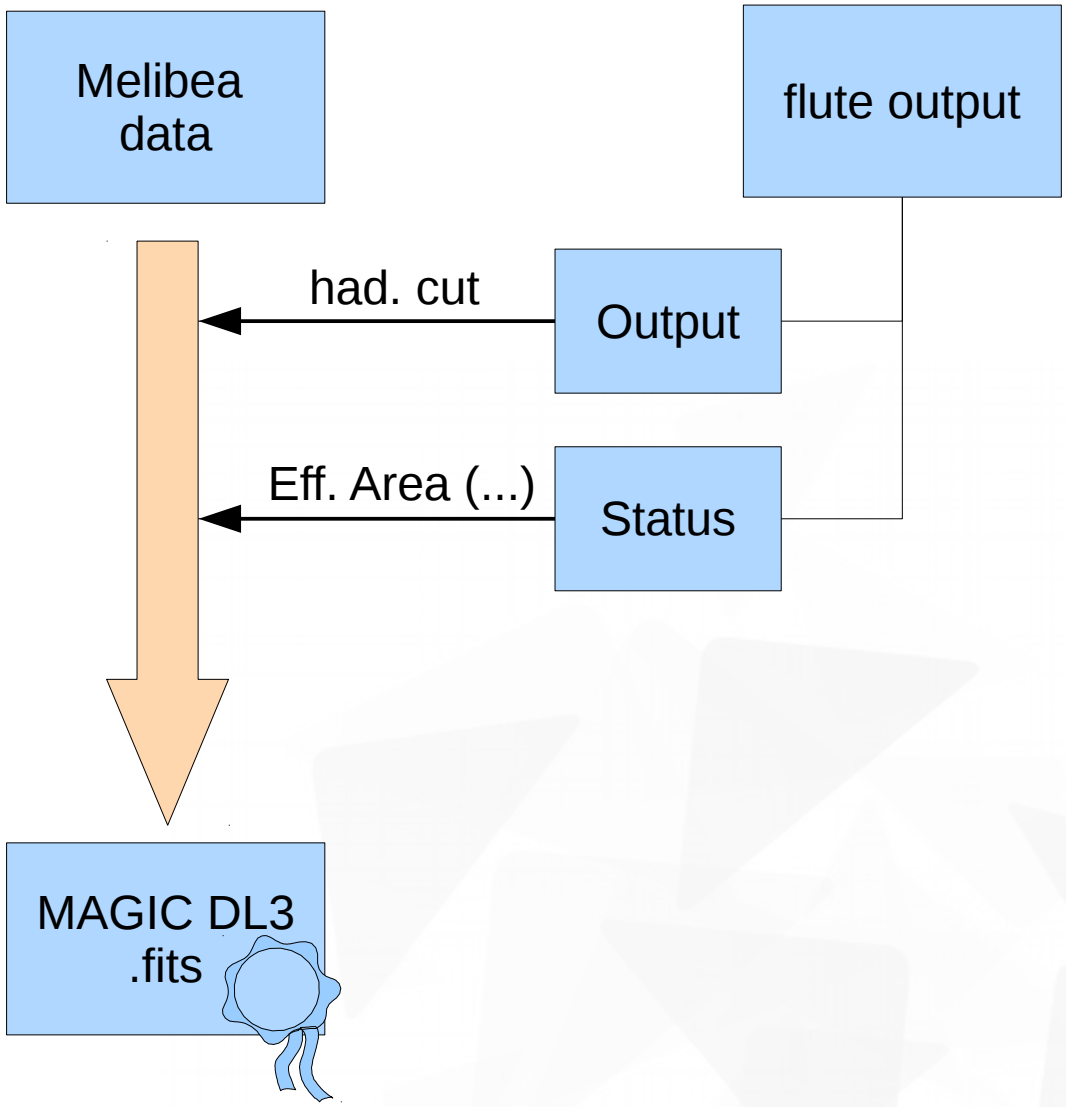
MAGIC data levels

- MAGIC current data levels



MAGIC IRFs status

- We could extract point-like IRFs from the standard software output
- MAGIC IRFs are usually never calculated as a function of the FoV
- The bast majority of our analyses are point-like anyway...



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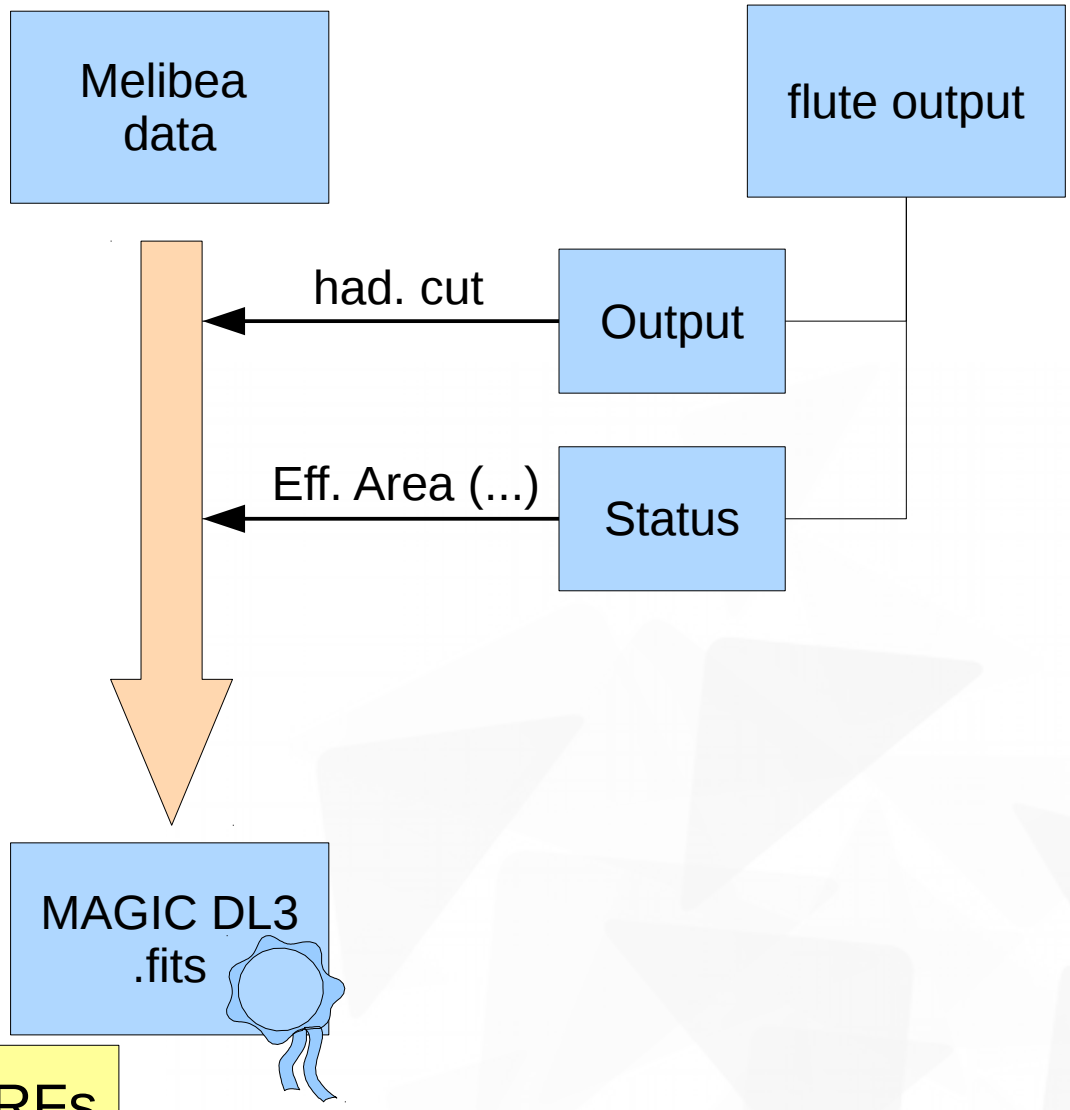


Convenient if Point-like IRFs are supported by DL3

MAGIC DL3 status – Current approach

- MAGIC runs are variable (shifters modify their length) ~ 20 min
- GTIs are defined by the first step of the analysis: data selection
    - A lot of information is used to remove bad time intervals: atmospheric transparency (lidar), number of stars, rates, thresholds, DC current
- Currently storing full-enclosure IRFs using the following formats:
    - aeff_2d, psf_table, edisp_2d, bkg_3d
- Cuts applied (size, hadronness) still not decided

DL3 WG report – Event lists

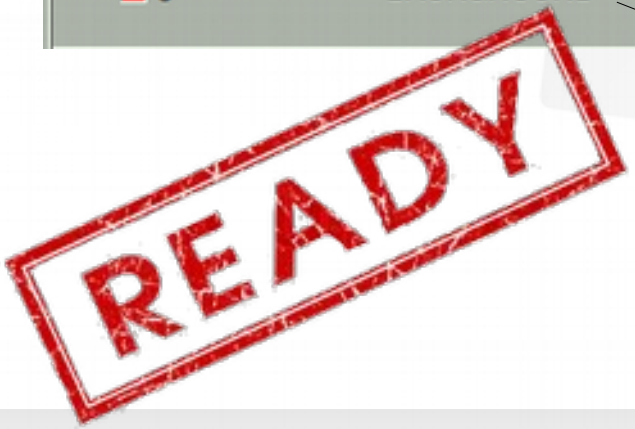
Event list

Select All / Invert	EVENT_ID 1E Modify	TIME 1E ms Modify	RA 1E deg Modify	DEC 1E deg Modify	ENERGY 1E TeV Modify	DETX 1E deg Modify
1	2.102000E+03	-1.235358E+04	8.300000E+01	2.200000E+01	4.158058E-02	-3.782977E-01
2	2.128000E+03	-1.235348E+04	8.300000E+01	2.200000E+01	8.006359E-01	7.463800E-02
3	2.132000E+03	-1.235347E+04	8.300000E+01	2.100000E+01	5.360562E-02	2.766988E-01
4	2.233000E+03	-1.235303E+04	8.500000E+01	2.200000E+01	5.537908E-02	3.413149E-01
5	2.251000E+03	-1.235295E+04	8.200000E+01	2.100000E+01	1.010068E-01	-1.937702E-01
6	2.262000E+03	-1.235291E+04	8.400000E+01	2.200000E+01	5.455283E-02	4.099209E-01
7	2.263000E+03	-1.235291E+04	8.400000E+01	2.200000E+01	2.786112E-01	-1.931990E-02
8	2.272000E+03	-1.235288E+04	8.400000E+01	2.100000E+01	4.362389E-02	4.822730E-01
9	2.303000E+03	-1.235270E+04	8.300000E+01	2.200000E+01	4.249199E-02	-7.881756E-02
10	2.361000E+03	-1.235245E+04	8.300000E+01	2.200000E+01	3.423890E-02	-3.592524E-01
11	2.378000E+03	-1.235238E+04	8.400000E+01	2.200000E+01	3.749027E-02	4.004716E-01
12	2.405000E+03	-1.235224E+04	8.300000E+01	2.100000E+01	3.146259E-01	7.247214E-01
13	2.427000E+03	-1.235213E+04	8.300000E+01	2.200000E+01	2.106351E-01	-4.061462E-01
14	2.550000E+03	-1.235168E+04	8.200000E+01	2.300000E+01	3.580425E-01	-1.274018E+00
15	2.596000E+03	-1.235140E+04	8.400000E+01	2.100000E+01	9.791556E-02	9.428987E-01
16	2.610000E+03	-1.235133E+04	8.400000E+01	2.200000E+01	8.045276E-02	-4.927695E-01
17	2.617000E+03	-1.235130E+04	8.300000E+01	2.200000E+01	1.284512E-01	-3.097619E-01
18	2.625000E+03	-1.235127E+04	8.300000E+01	2.200000E+01	5.889448E-02	5.282745E-02
19	2.636000E+03	-1.235123E+04	8.300000E+01	2.200000E+01	6.852181E-02	-1.694564E-01
20	2.660000E+03	-1.235113E+04	8.300000E+01	2.200000E+01	7.210232E-02	-7.135937E-01

DL3 WG report – IRFs

- Event lists + IRFs within the same “DL3” file

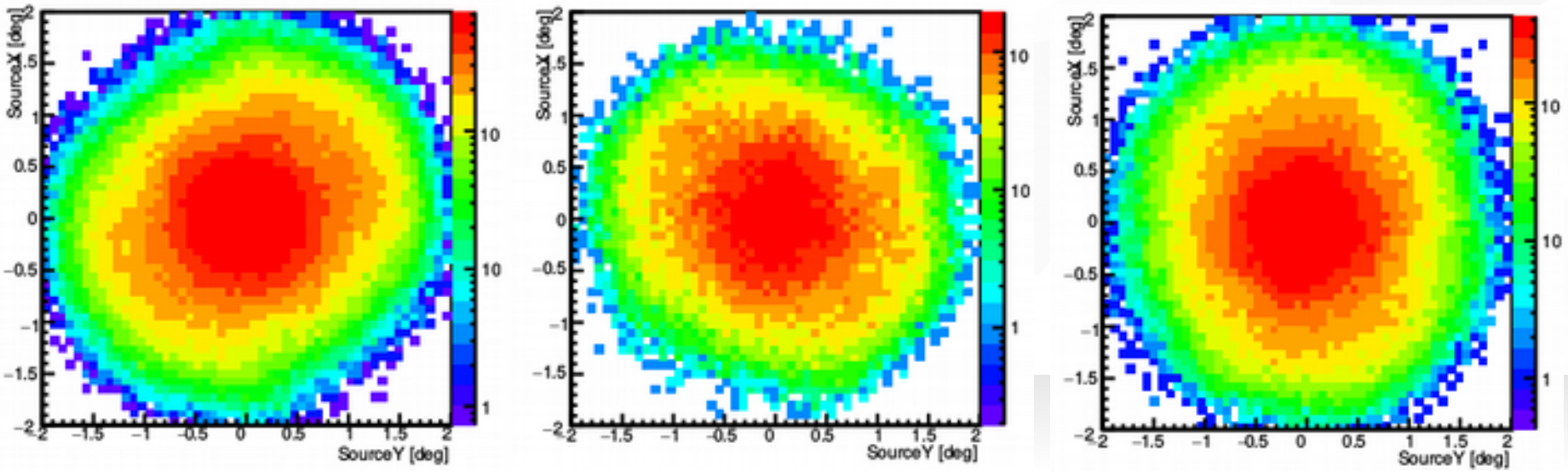
Index	Extension	Type	Dimension	View
0	Primary	Image	0	Header | Image | Table
1	EVENTS	Binary	7 cols X 11940 rows	Header | Hist | Plot | All | Select
2	GTI	Binary	2 cols X 1 rows	Header | Hist | Plot | All | Select
3	EFFECTIVE AREA	Binary	5 cols X 1 rows	Header | Hist | Plot | All | Select
4	POINT SPREAD FUNCTION	Binary	7 cols X 1 rows	Header | Hist | Plot | All | Select
5	ENERGY DISPERSION	Binary	7 cols X 1 rows	Header | Hist | Plot | All | Select
6	BACKGROUND	Binary	5 cols X 1 rows	Header | Hist | Plot | All | Select



I better not start talking about background modeling...

DL3 status – Possible additions

- MAGIC has only 2 telescopes:
  - IRFs are not radially symmetric:
    - Radial symmetry should not be “imposed” by DL3
    - Obvious additions:
      - “3D” effective area, PSF, mig. matrix



MAGIC DL3 status

- MAGIC DL3 fits files “kind of” ready:
    - Lacking background modeling
    - IRFs never cross-checked (so probably wrong, but approximately ok)
- Current DL3 format for MAGIC:
    - Would be nice if point-like IRFs were supported by DL3 format (and obviously, also science tools)
    - 2D field of view dependency would be desired
        - Maybe also required for CTA? (sub-arrays or 3 LST subsystems may have the same problem)