

VERITAS DL3 Summary

Development and implementation by

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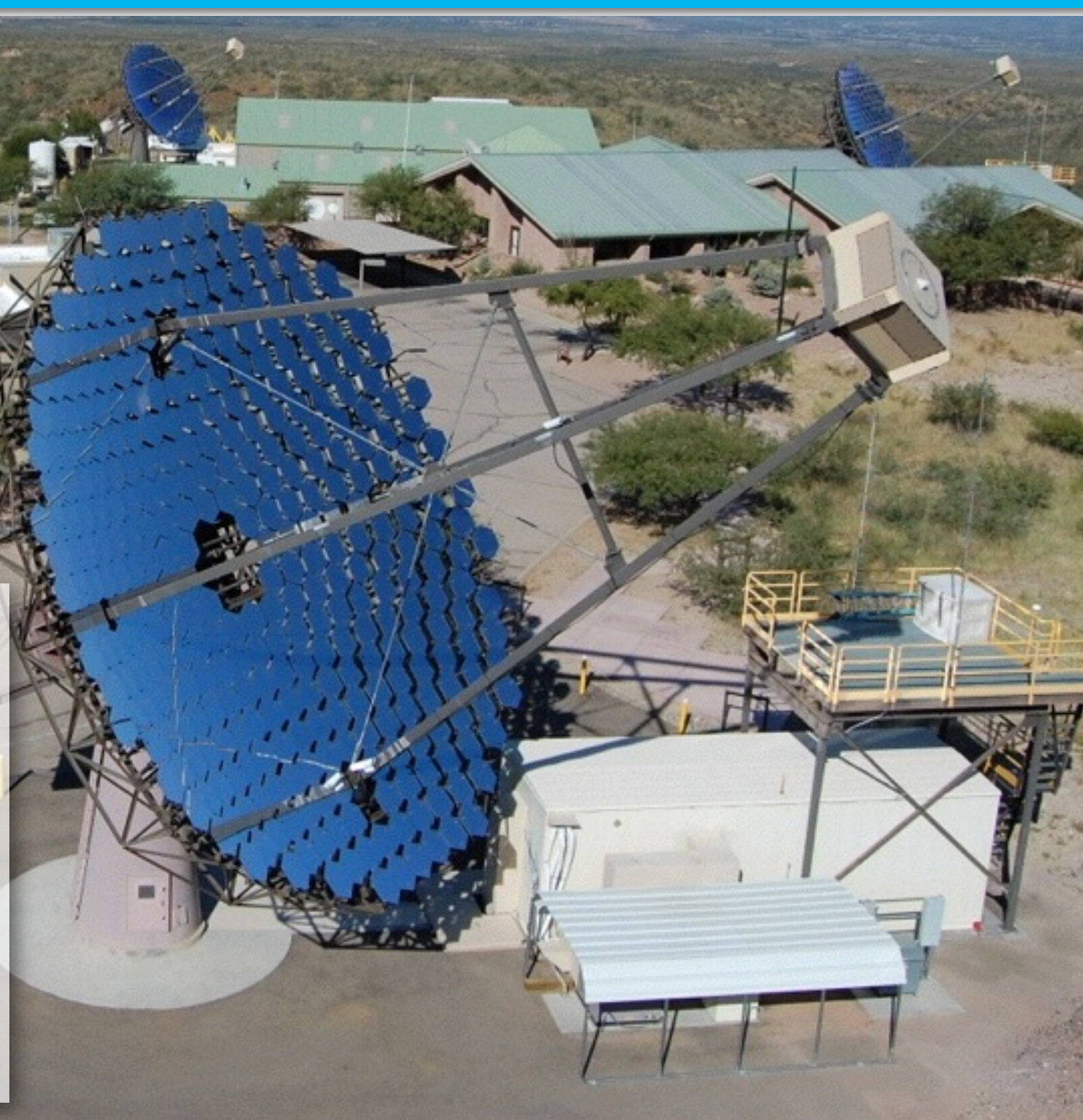
Nathan Kelly-Hoskins (DESY)

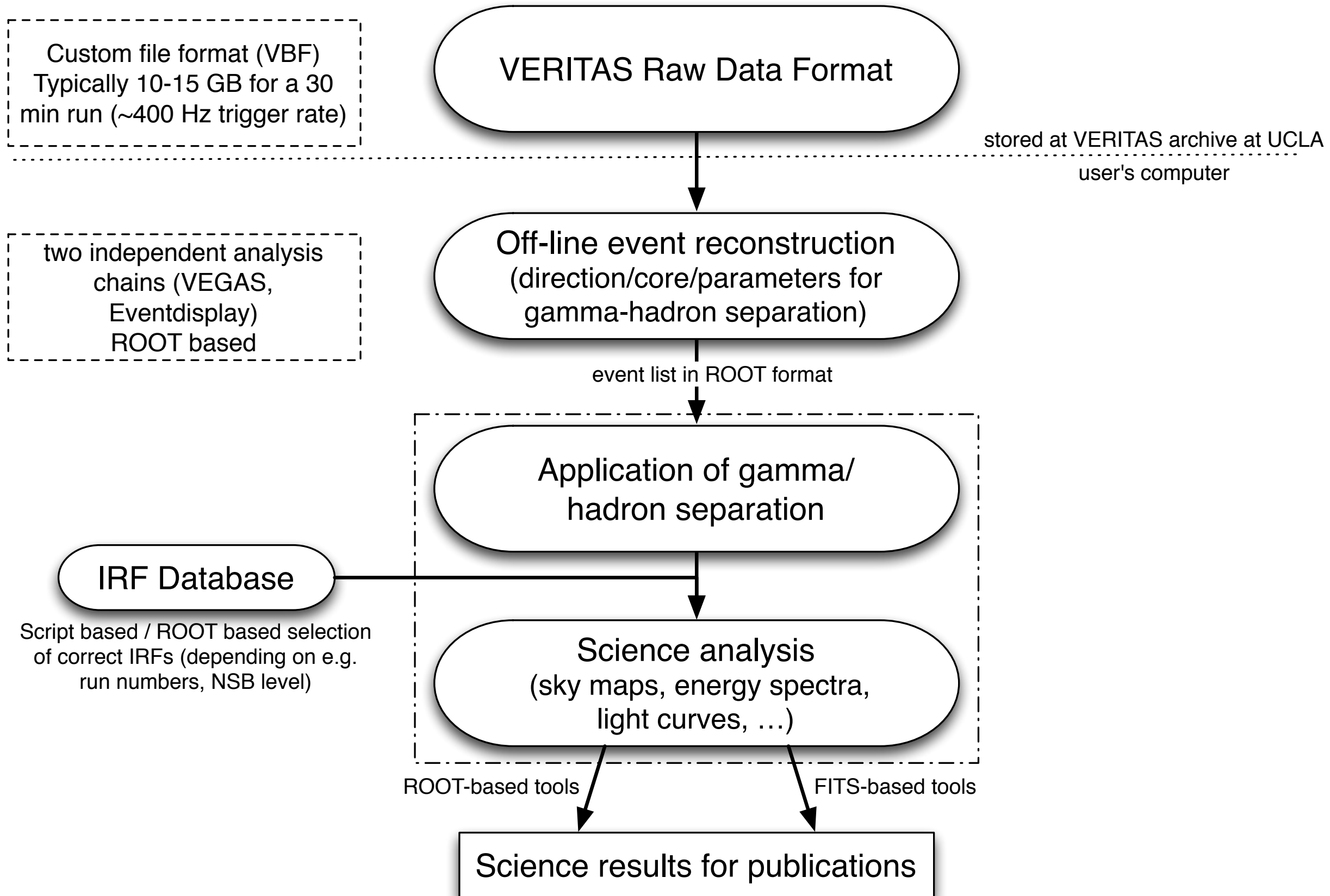
Gernot Maier

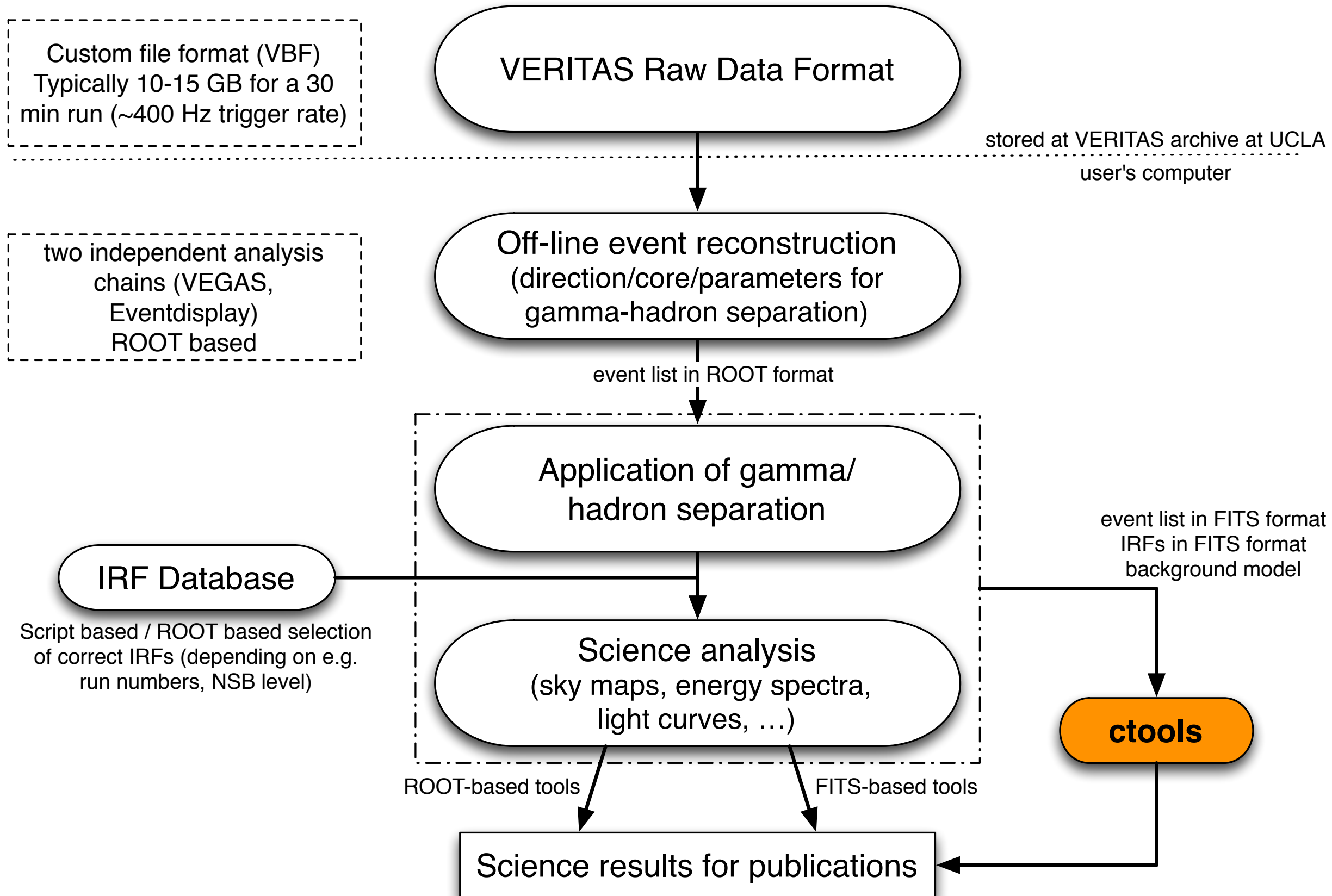


Alliance for Astroparticle Physics

- array of four 12 m Imaging Atmospheric Cherenkov Telescopes located in southern Arizona
- energy range: 85 GeV to >30 TeV
- field of view of 3.5°
- angular resolution $\sim 0.08^\circ$ at 1 TeV
- point source sensitivity (5σ detection): 1% Crab in < 25 h (10% in 25 min)







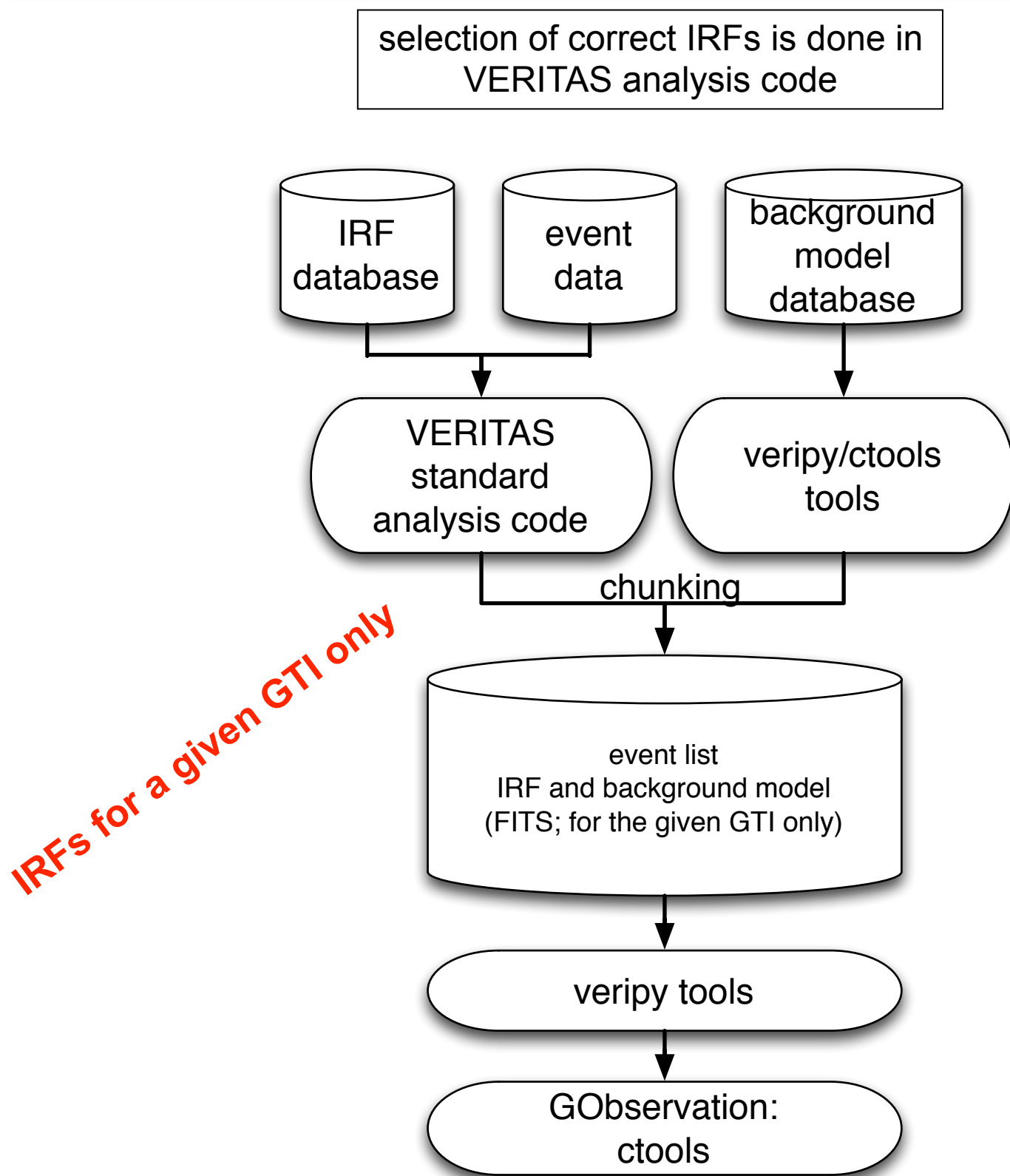
Side remark: size of IRF data base

> IRF data base quite big:

- zenith angle (x10)
- azimuth bins (x4)
- night-sky background (x11)
- offset bins (x9)
- summer and winter atmospheres (x2)
- states of the instrument: before T1 move, after T1 move, after camera upgrade (x3)
- operational states: nominal HV, reduced HV, UV filter; different trigger thresholds (x3-6)
- analysis: geometrical, DISP, image template (x1-3)
- super-soft, soft, medium, hard cuts for point and extended sources (x8)
- (...)

> e.g. $>10^6$ effective areas are produced for each software version

IRF handling: two very different solutions



Data chunks

- > a single self-contained FITS file contains everything required for the analysis of a GTI
 - event list
 - IRFs
 - source & background model

Index	Extension	Type	Dimension
<input type="checkbox"/> 0	Primary	Image	0
<input type="checkbox"/> 1	EVENTS	Binary	24 cols X 195 rows
<input type="checkbox"/> 2	TELARRAY	Binary	13 cols X 4 rows
<input type="checkbox"/> 3	GTI	Binary	2 cols X 1 rows
<input type="checkbox"/> 4	POINT SPREAD FUNCTION	Binary	6 cols X 1 rows
<input type="checkbox"/> 5	EFFECTIVE AREA	Binary	6 cols X 1 rows
<input type="checkbox"/> 6	BACKGROUND	Binary	7 cols X 1 rows

(tiny: < 1MB for a 30 min run)

length of a GTI set by hand - should be done by a tool
based on information like tracking speed, changes in
NSB rate, etc.

Conclusions

- > different interfaces between VERITAS data analysis and ctools in development at this point
 - significant work in converting IRFs from VERITAS format into FITS; verification ongoing
 - verification of science results (but: sometimes hard to compare results from max likelihood analysis with results obtained by conventional methods)
- > discussion of long-term data conservation in DL3 format just started in VERITAS

Crab
Nebula

