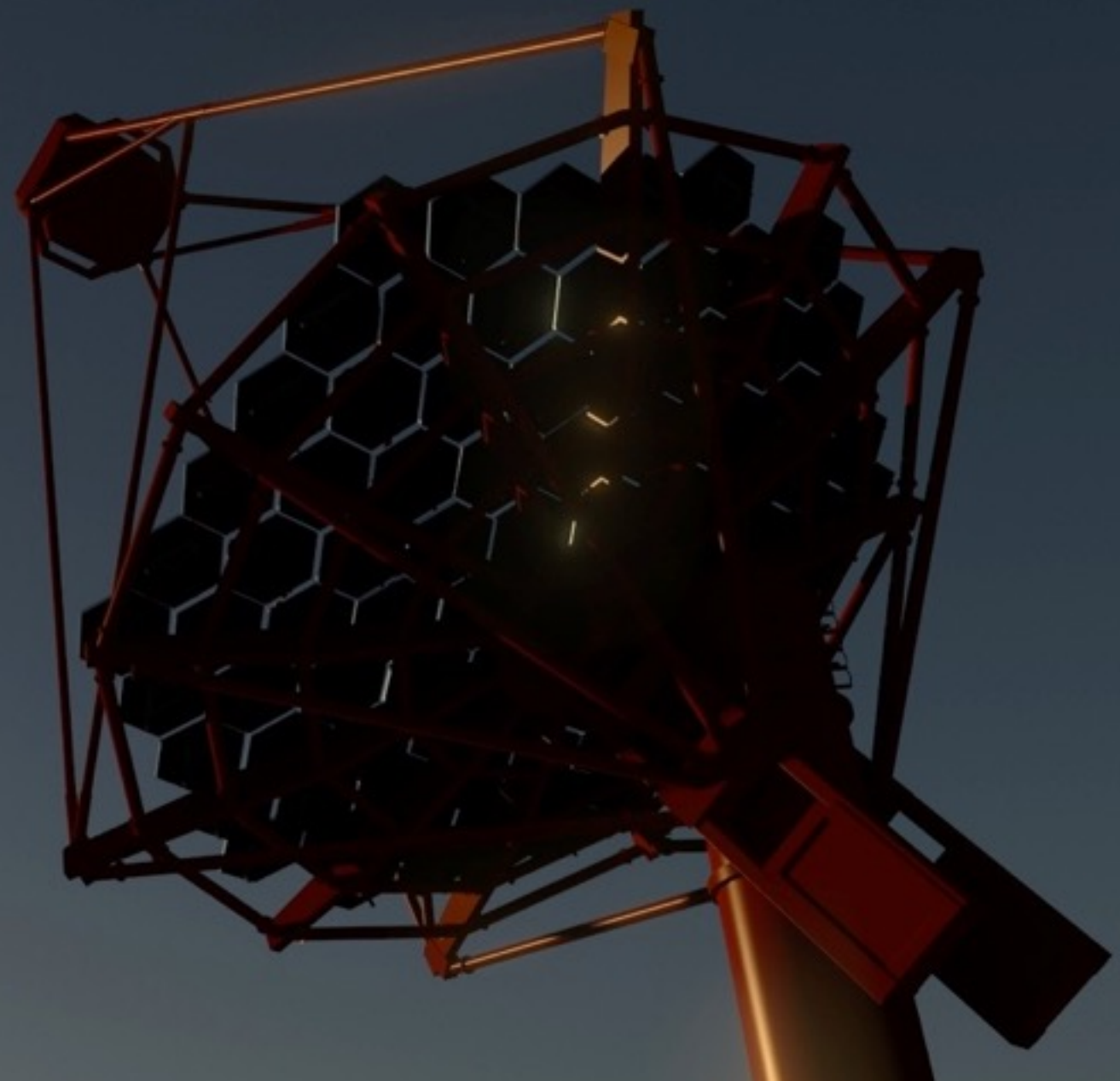


CTA Monte Carlo Pipeline

A very short overview



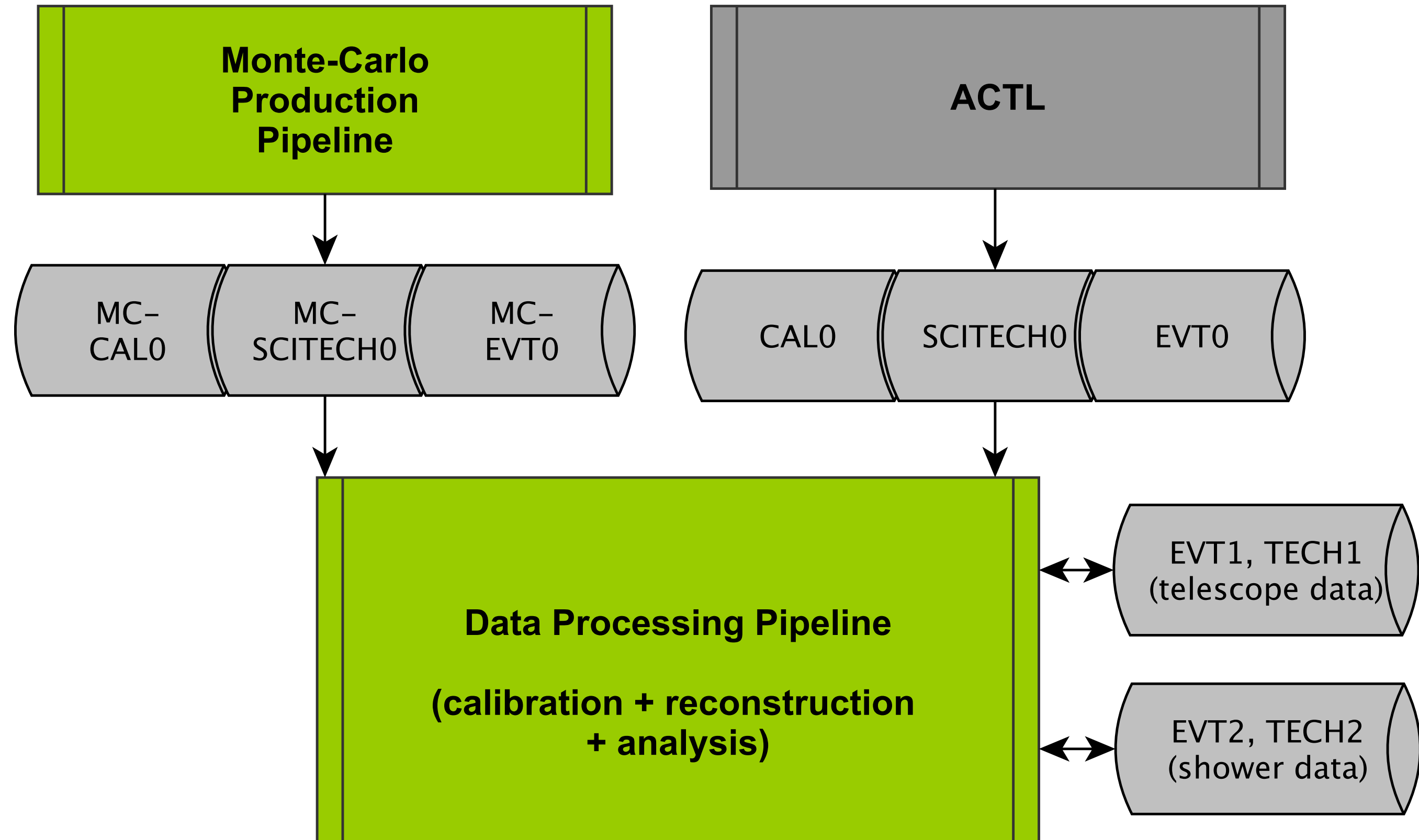
Gernot Maier



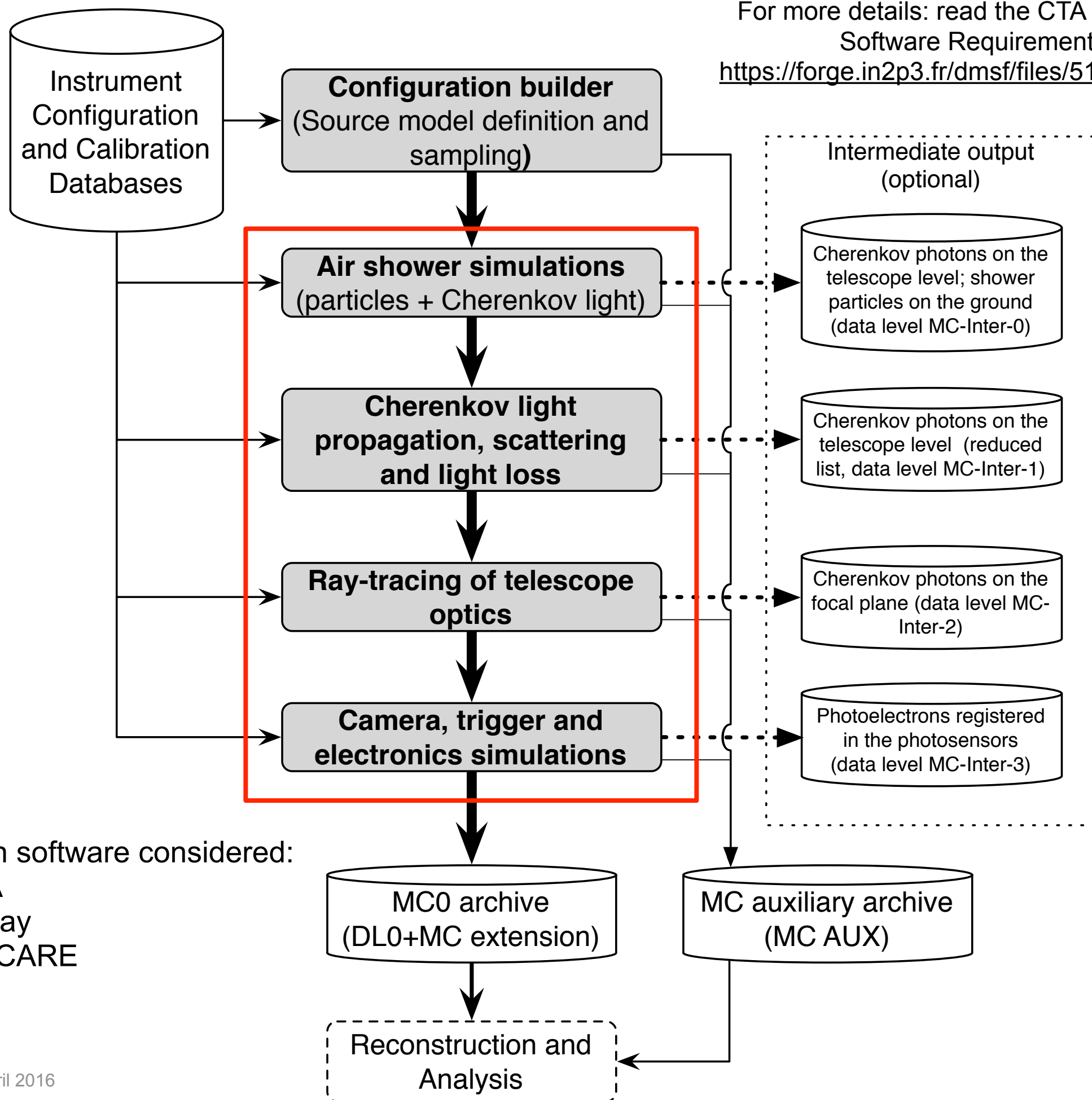
 **HELMHOLTZ**
| ASSOCIATION

Alliance for Astroparticle Physics

MC Pipeline - ctapipe



For more details: read the CTA Simulation Software Requirements
<https://forge.in2p3.fr/dmsf/files/515/download>



Simulation software considered:
 CORSIKA
 sim_telarray
 GrOptics/CARE

Relevant requirement



Top Level Requirement

CTA Construction Project | Top Level Requirements | Science Requirements

Name: SCI-170 Energy scale uncertainty

Description:

Systematic errors in the CTA energy scale must not exceed 10%.

Class: Requirement

Applicable State: All

Global ID: CTA-20530

Project ID: CTA-_-38

Status: Approved

MC Production strategies: classical and run wise

> Classical: generate MC sets for each point in a large phase space

- fixed zenith, azimuth, offsets, night-sky background, array layout, atmospheric profiles, etc.
- any change in the instrument (e.g. trigger settings, HV changes) requires a new MC set
- instrument ageing often ignored and corrected later using correction factors
- phase space is huge if one aims to meet systematic uncertainty requirements!
ze (10) x az (4) x offset (6) x NSB (10) x ? x ? = 2400 phase space points
- with reduced accuracy required for RTA (Level A), next-day analysis (Level B), basic analysis of all CTA observations

> Run-wise: produce MC sets for certain observation periods / directions

- simulate (sub-)array of telescopes that are tracking a sky position
- consider e.g. broken pixels, calibration, night-sky background, atmospheric model for this run
- by definition much closer to reality than full phase-space approach; no need for data correction!
- requires a reasonable quick turnaround of all calibration / validation steps
- only done for regions of interests where the systematic uncertainty requirement is applicable

