

The new Sum-Trigger-II system for the MAGIC Telescopes

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MAGIC TELESCOPES

Stereoscopic system 2 IACTS, 17m diameter

**Location ORM(28°N, 18°W)
2200m asl**

Energy threshold 50 GeV

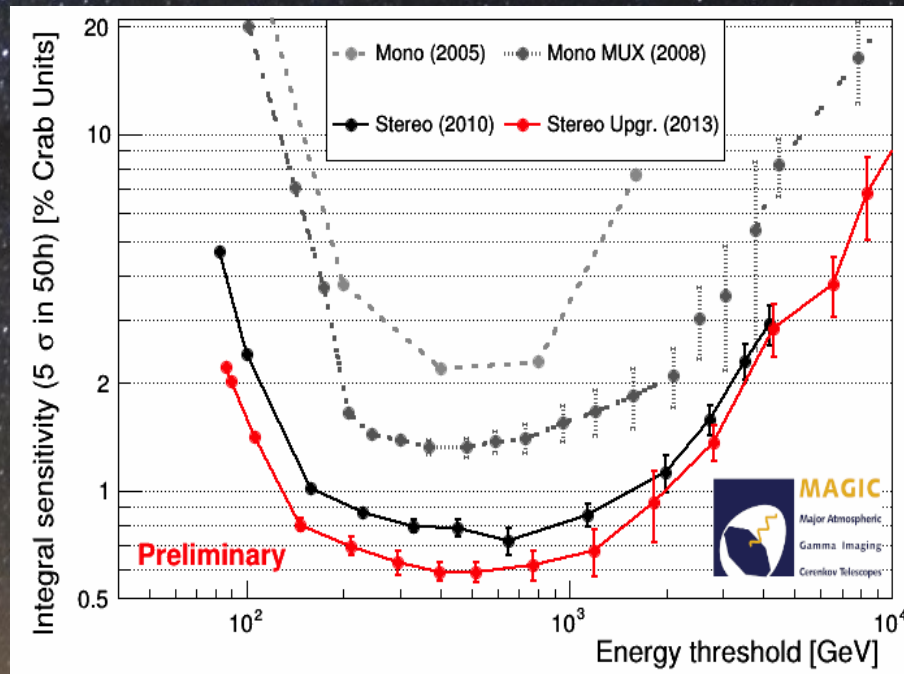
**Angular Resolution Better than 0.1°
for all energies.**

Flux Sensitivity <0.7% Crab at 200 GeV.

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(Werner-Heisenberg-Institut)

LOW ENERGY OBSERVATIONS

Motivations & Difficulties

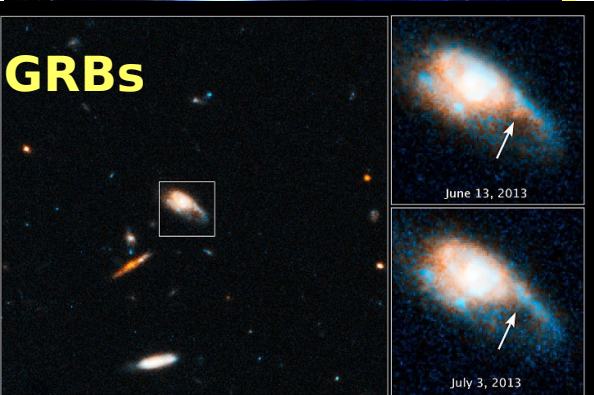
PULSARS



AGNs, EBL



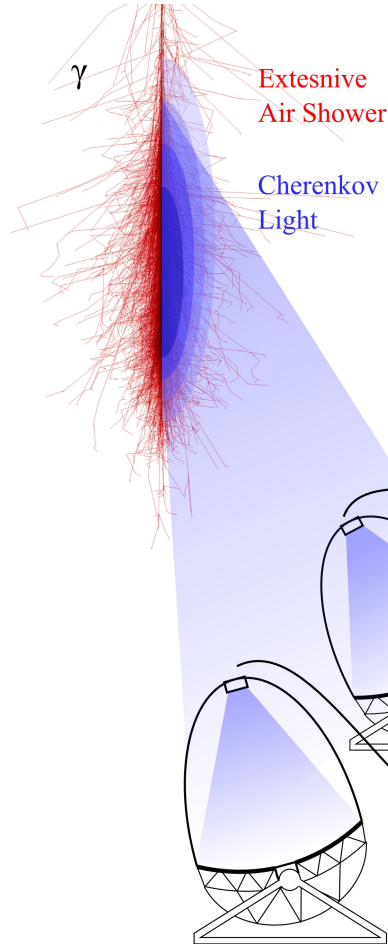
GRBs



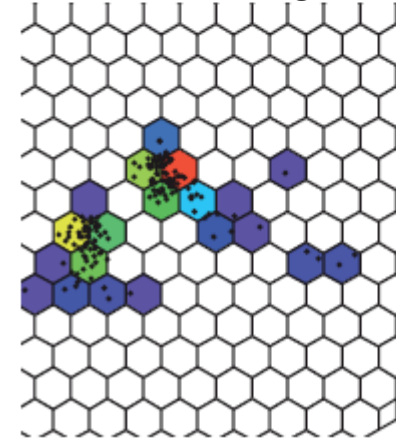
Gamma-ray Burst GRB 130603B
Hubble Space Telescope • ACS/WFC3

NASA and ESA

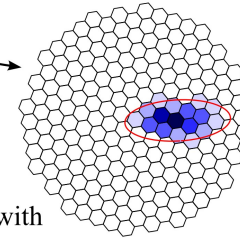
STScI-PRC13-29a



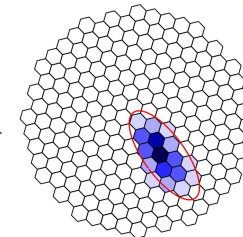
But at low energies:



Cameras with
PMT pixels



Air Shower
Images

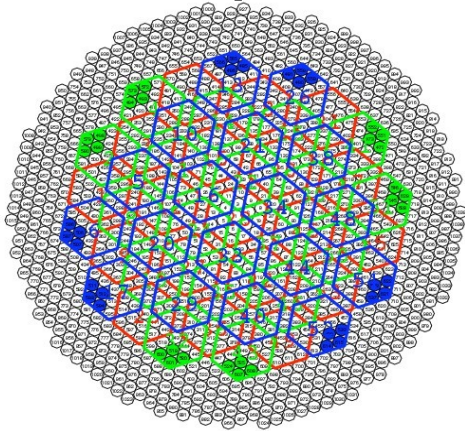




THE SUM-TRIGGER II

The Concept

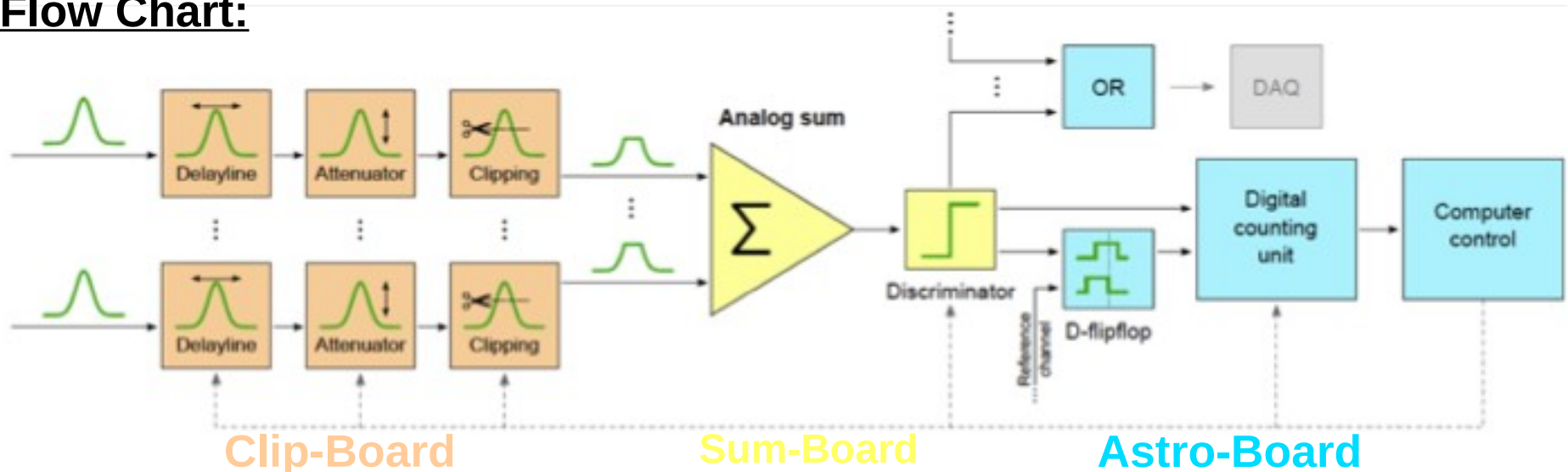
Concept:



- Sum of analog signals of a patch of 19 PMTs.
- Use small photon signals below the single channel threshold.
- Integration of larger area (size of shower) increases S/N.
- Camera subdivide in 55 macrocells that operate independently.
- The final trigger is a Global OR of the local macrocells trigger.

Prototype allowed the discover of the **first Pulsar at VHE** !!(Aliu et. al 2008, Science 322:1221)

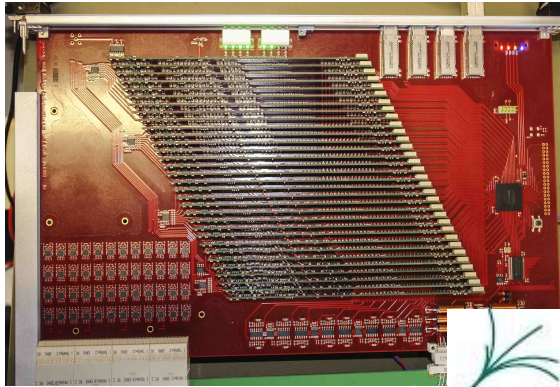
Flow Chart:



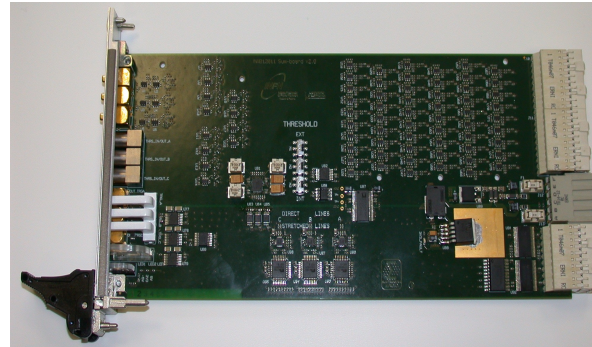


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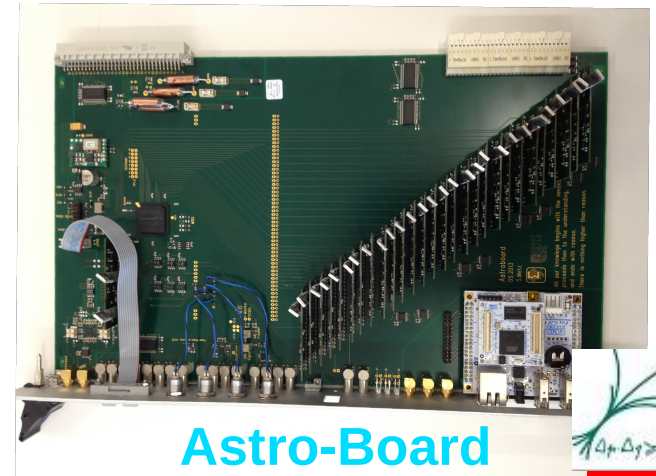
HARDWARE & INSTALLATION



Clip-Board



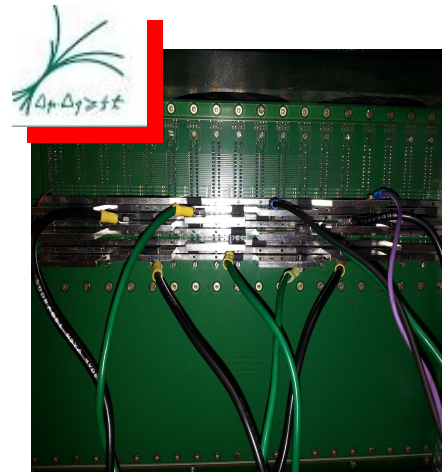
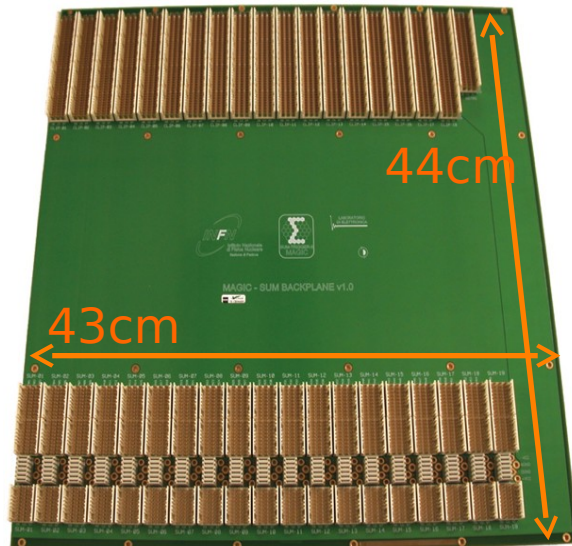
Sum-Board



Astro-Board



Other Hardware:





PERFORMANCE

Monte Carlo Simulation

Comparison stereo energy threshold

