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2016 – 2022 Bachelor of Science in Physics
Aristotle University of Thessaloniki

2021 DESY Summer School

Special thanks to Stefan Ohm, Dmitriy Kostiunin, Annanay Jaitly, Robert Daniel Parsons, and Gernot Maier.

DESY project:

- Composite supernova remnant (SNR) Kes 75 analysis using gammapy.

Results:

- Kes 75 was detected in the VHE range.
- The TeV source was point-like and its position was compatible with the pulsar wind nebula, but there was no evidence for a supernova remnant emission.

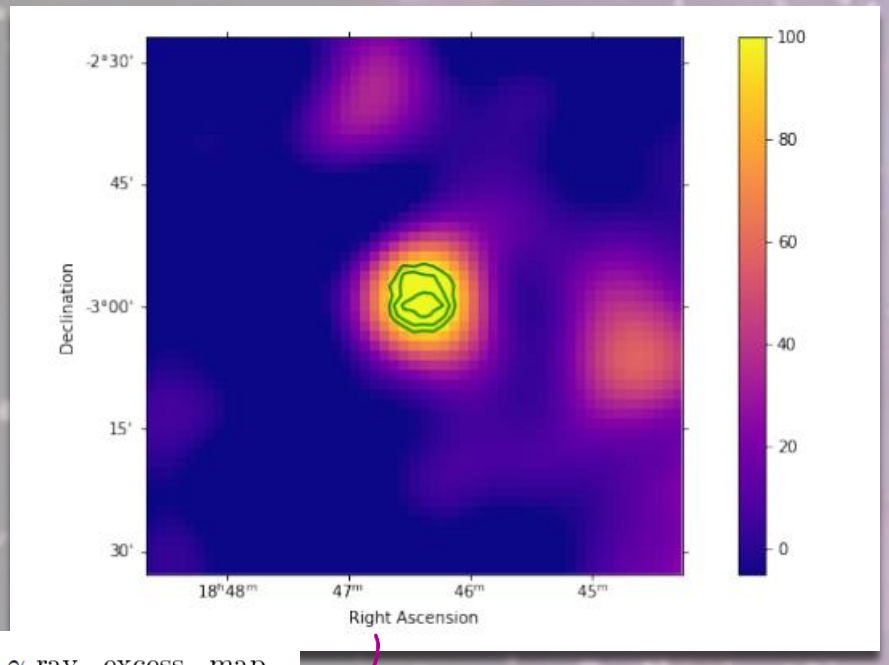


Figure 2: VHE γ-ray excess map, smoothed with a Gaussian of width $\sigma = 0.05°$, centered on the Kes 75 SNR position. Significance contours at 8, 9 and 10 σ obtained with a correlation radius of 0.1° are overlayed in green.

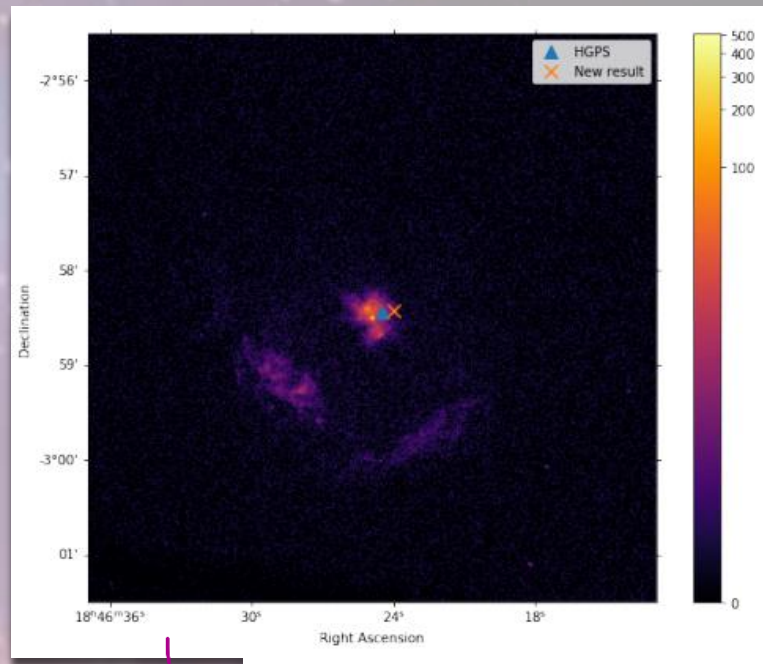


Figure 3: A Chandra 2-10 keV image of Kes 75. The markers indicate the pulsar's best-fit position.

- The spectrum was well represented by a power-law , but the spectral fit was slightly different comparing to HGPS.

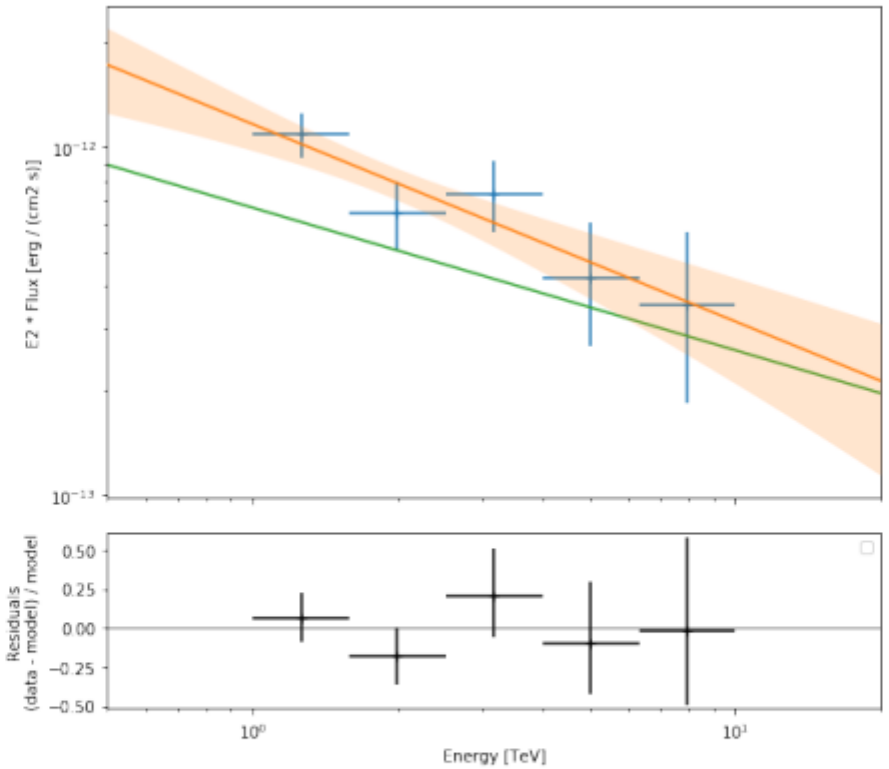


Figure 4: Differential energy spectra of Kes 75.The orange line is the best-fit of the flux points of Kes 75 and the green line is spectral energy contribution for the best-fit index as it was calculated according to the H.E.S.S. Galactic plane survey.

Bachelor's Thesis:

- Dark matter detection experiment, NEWS-G, which is a spherical proportional counter.
- Simulation of the pulses and the signals of the electrons that reach the anode moving through the counter's gas.
- Production of a big number of random signals and pulses of two or three electrons with the goal to count the individual primary electrons.

Special thanks to Ioannis Katsioulas, and Christos Eleftheriadis.

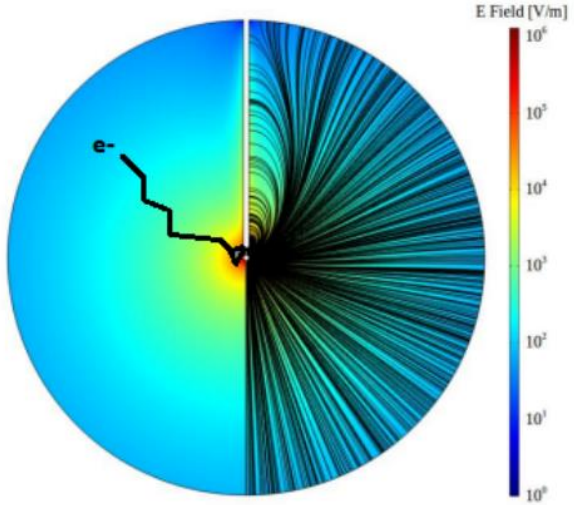


Figure 2.1: A schematic of the spherical proportional counter.

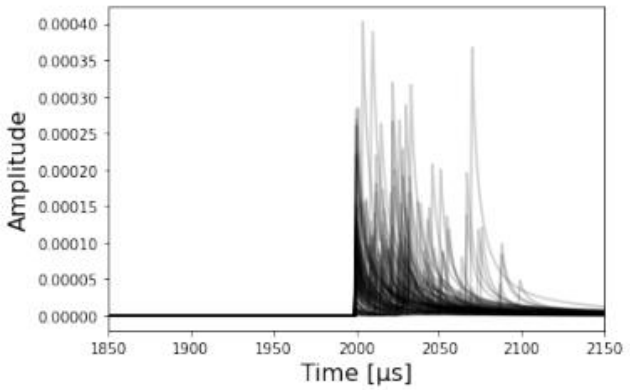


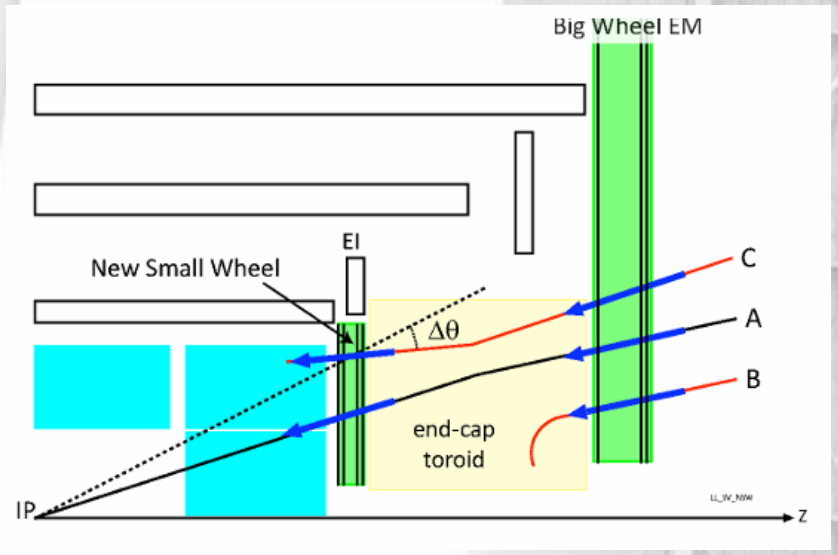
Figure 4.17: A plot of 100 raw pulses in the same graph when the radial distance is 30 cm.

2022 – Present Master in Physics: “Physics and Technological applications”
National Technical University in collaboration with the National Centre for Scientific Research Demokritos, Athens

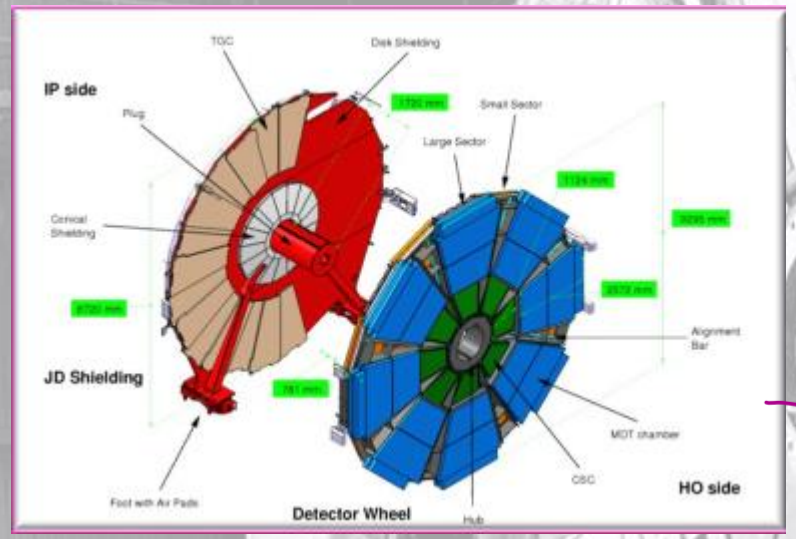
2023 CERN

Master's Thesis:

- Develop a tool for implementing automatically individual pad masking to the Pad Trigger of the New Small Wheel (NSW) muon detector in the ATLAS experiment.
  - TRIGGER: selection of the most "interesting" events and reject "boring" ones.



"Fake" muons triggers elimination in the endcap region



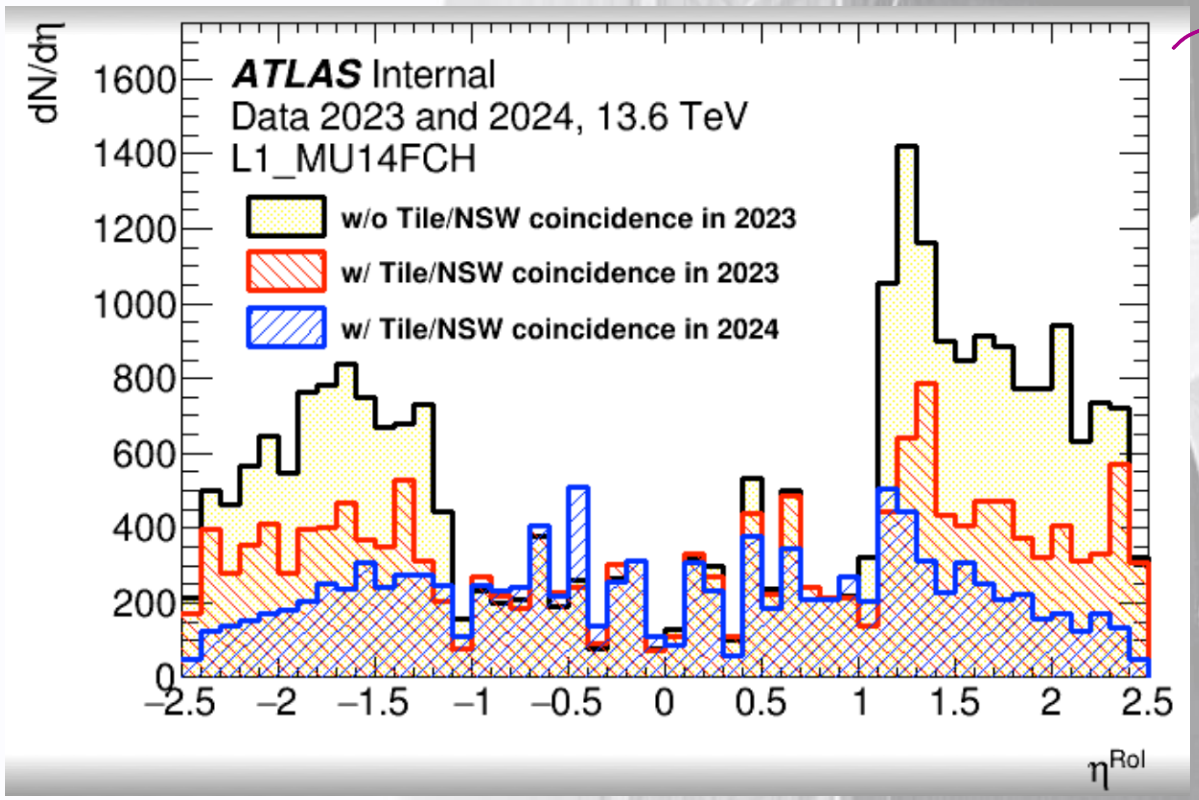
- Two wheel-shaped detectors
- 16 sectors per wheel (8 large and 8 small sectors)
- Two innovative gaseous detectors technologies:
  Micromegas (MM) and small-strip Thin Gap Chambers (sTGC), which offer fast and precise muon tracking capabilities.

- Coincidence → 3/4 and 2/4 layers give signal means that a muon passed
- If the coincidence is not satisfied, there is trigger.

- The detectors have some imperfections, missing pFEBs, HV off.

Results of masking:

✓ Before, we had 75% of the sectors with greater 95% Pad Trigger efficiency, and now, we have 100% of the sectors with an efficiency around 98%.



→ "fakes"

Special thanks to Theodoros Geralis.


The Best
is yet to come!