Background Subtraction Improvement for mono-analysis with H.E.S.S II

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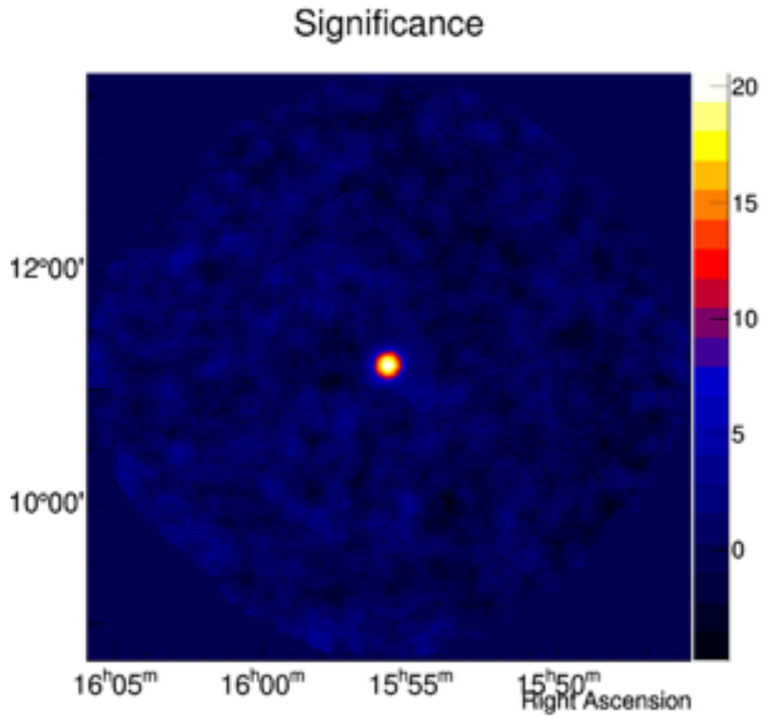
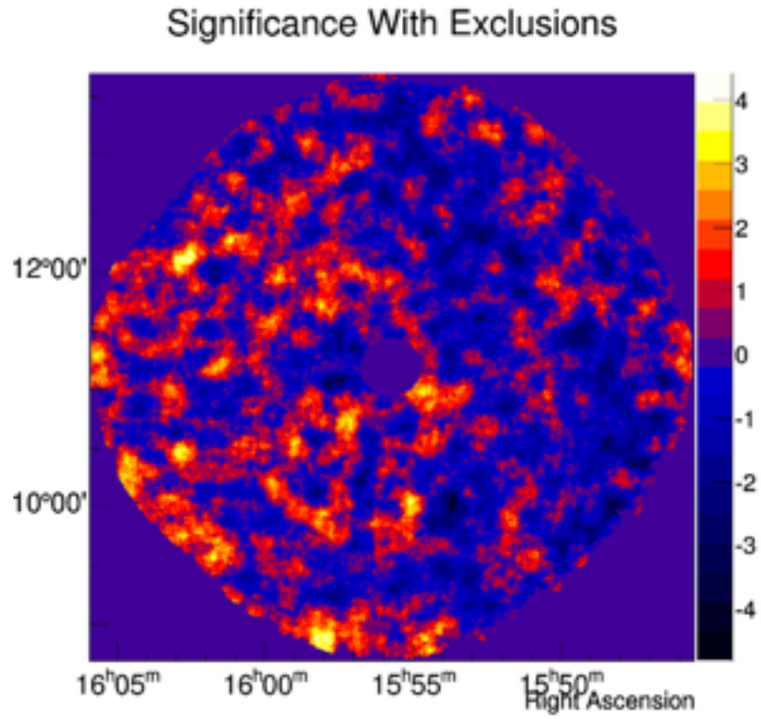
- HESSII phase includes CT5 since oct 2012
- Energy range down to 55 GeV (for std cuts)
- Mono analyses are quite performant - nice results to be published soon…
- Loosing stereoscopy is challenging
- I try to correct some gradient in the background for the ImPACT analysis chain.

PG1553

$$N_{\text{excess}} = N_{\text{on}} - \alpha N_{\text{off}} .$$

$$\alpha = \frac{\int_{\text{on}} A^{\gamma}_{\text{on}}(\theta_x, \theta_y, \phi_z, t)\, \mathrm{d}\theta_x\, \mathrm{d}\theta_y\, \mathrm{d}\phi_z\, \mathrm{d}t}{\int_{\text{off}} A^{\gamma}_{\text{off}}(\theta_x, \theta_y, \phi_z, t)\, \mathrm{d}\theta_x\, \mathrm{d}\theta_y\, \mathrm{d}\phi_z\, \mathrm{d}t} .$$





$$S = \sqrt{-2 \ln \lambda} = \sqrt{2} \left\{ N_{\text{on}} \ln \left[\frac{1+\alpha}{\alpha} \left(\frac{N_{\text{on}}}{N_{\text{on}} + N_{\text{off}}} \right) \right] + N_{\text{off}} \ln \left[(1+\alpha) \left(\frac{N_{\text{off}}}{N_{\text{on}} + N_{\text{off}}} \right) \right] \right\}^{1/2}$$

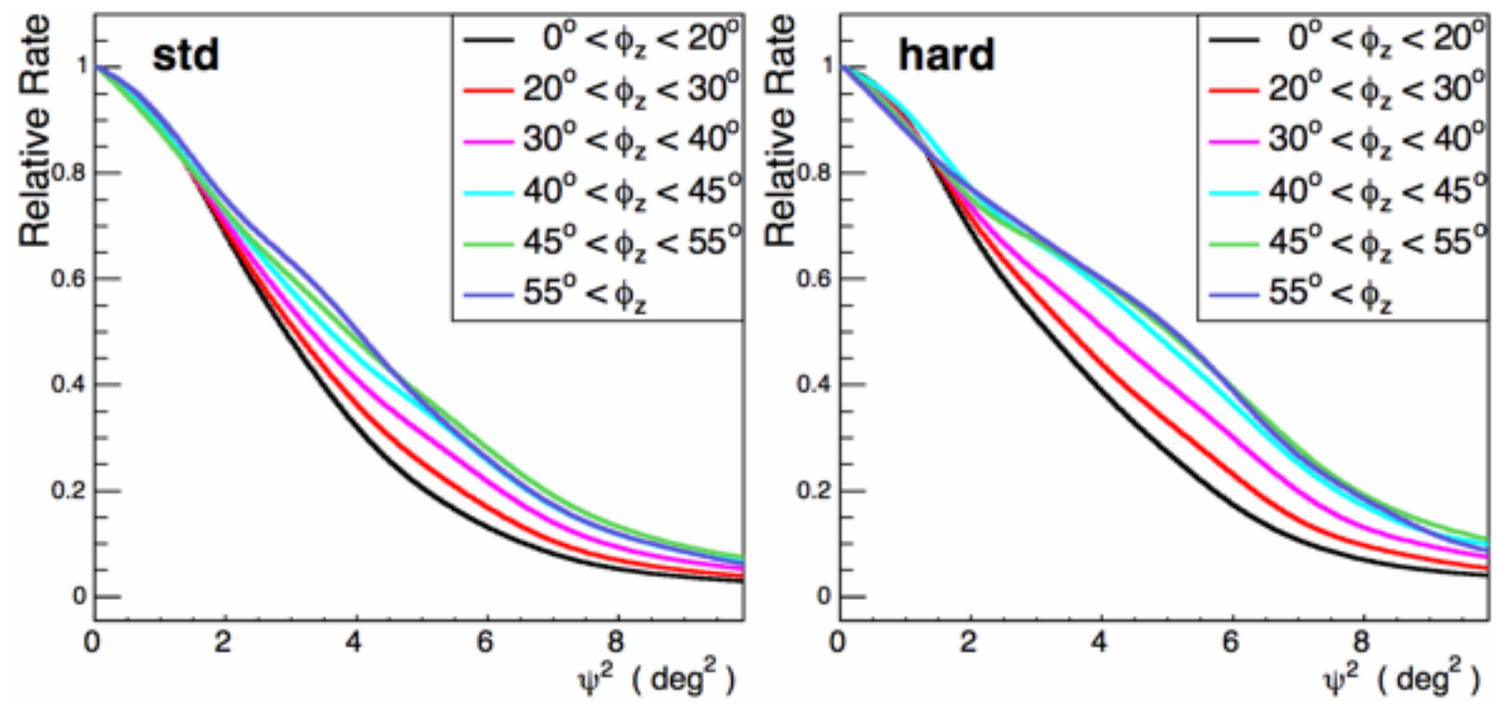
Li & Ma 1983

H.E.S.S.

How to solve it?

Radial Acceptance Map

$$\alpha = \frac{\int_{\text{on}} A^{\gamma}_{\text{on}}(\psi^2, \phi_z, t)\, \mathrm{d}\theta_x\, \mathrm{d}\theta_y\, \mathrm{d}\phi_z\, \mathrm{d}t}{\int_{\text{off}} A^{\gamma}_{\text{off}}(\psi^2, \phi_z, t)\, \mathrm{d}\theta_x\, \mathrm{d}\theta_y\, \mathrm{d}\phi_z\, \mathrm{d}t}.$$



D.Berge and al 2007

H.E.S.S.

How to solve it?

The idea is to estimate this gradient by a 2D fitting of the Significance with Exclusions map and then add a correction factor to the acceptance map.

….Work in progress!

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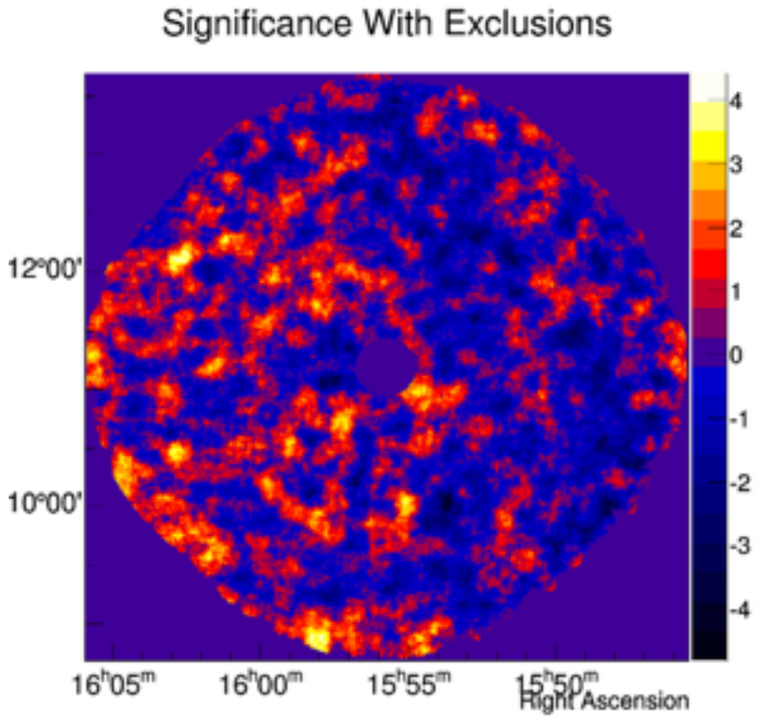
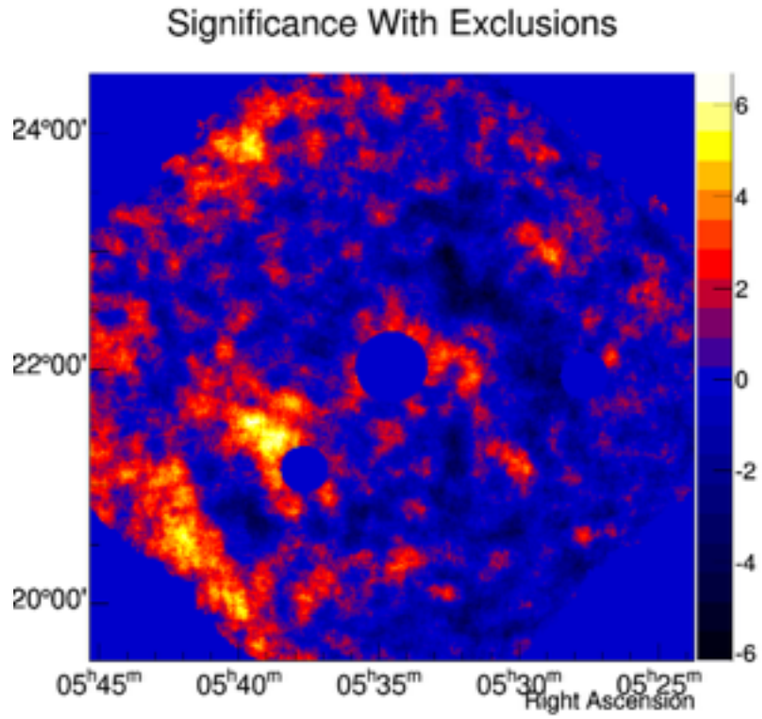


Crab



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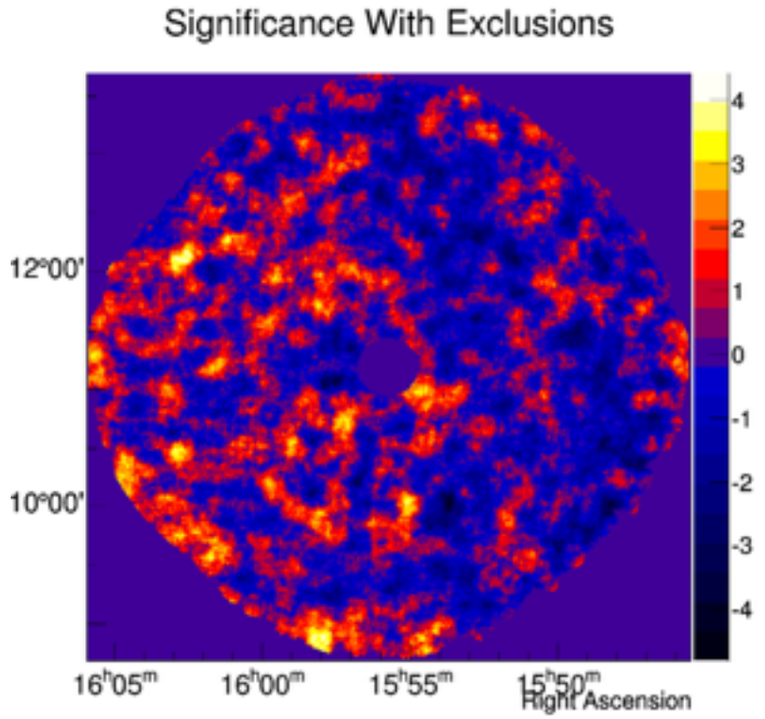

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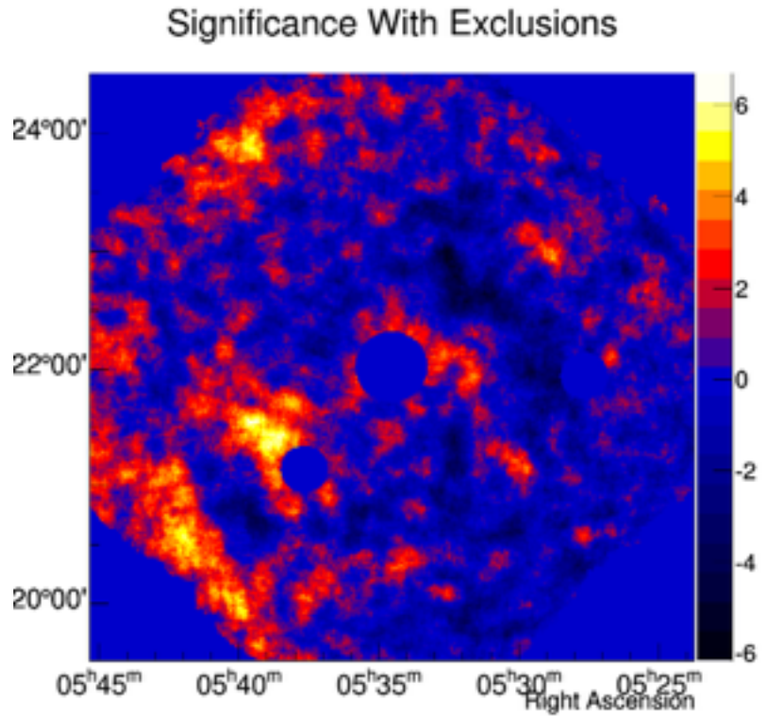

Thank you!

H.E.S.S.