Study of partial arrays impact on CTA optimization

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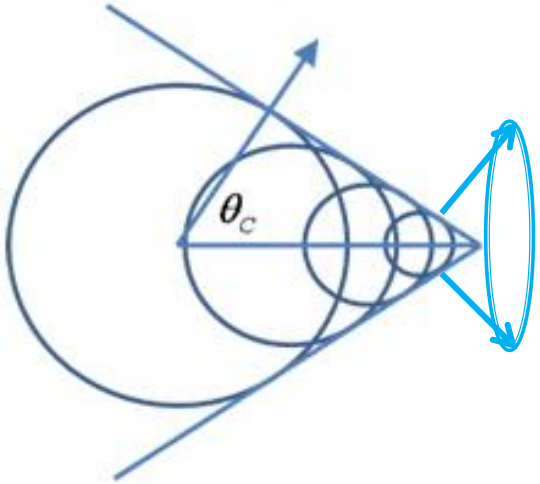
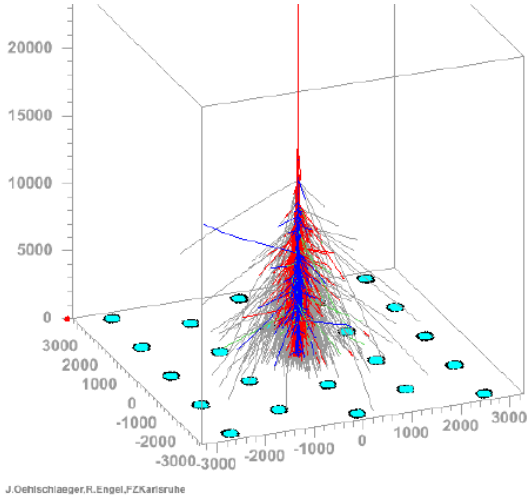
MAGIC group

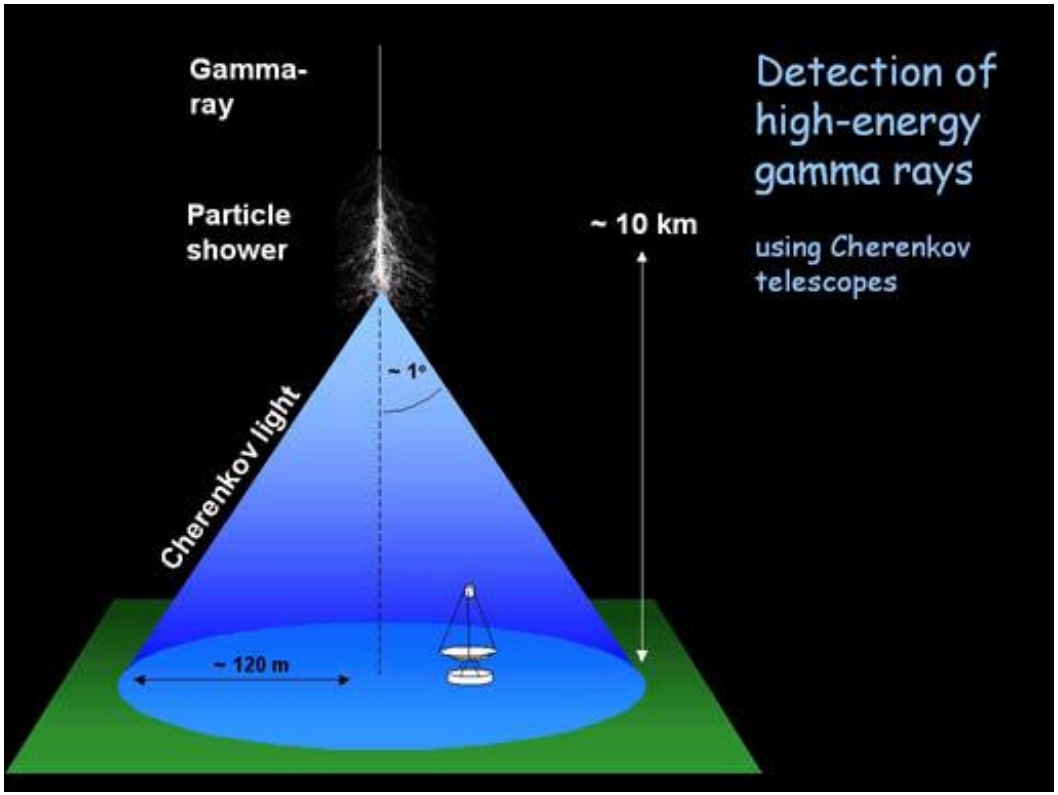
The Cherenkov light



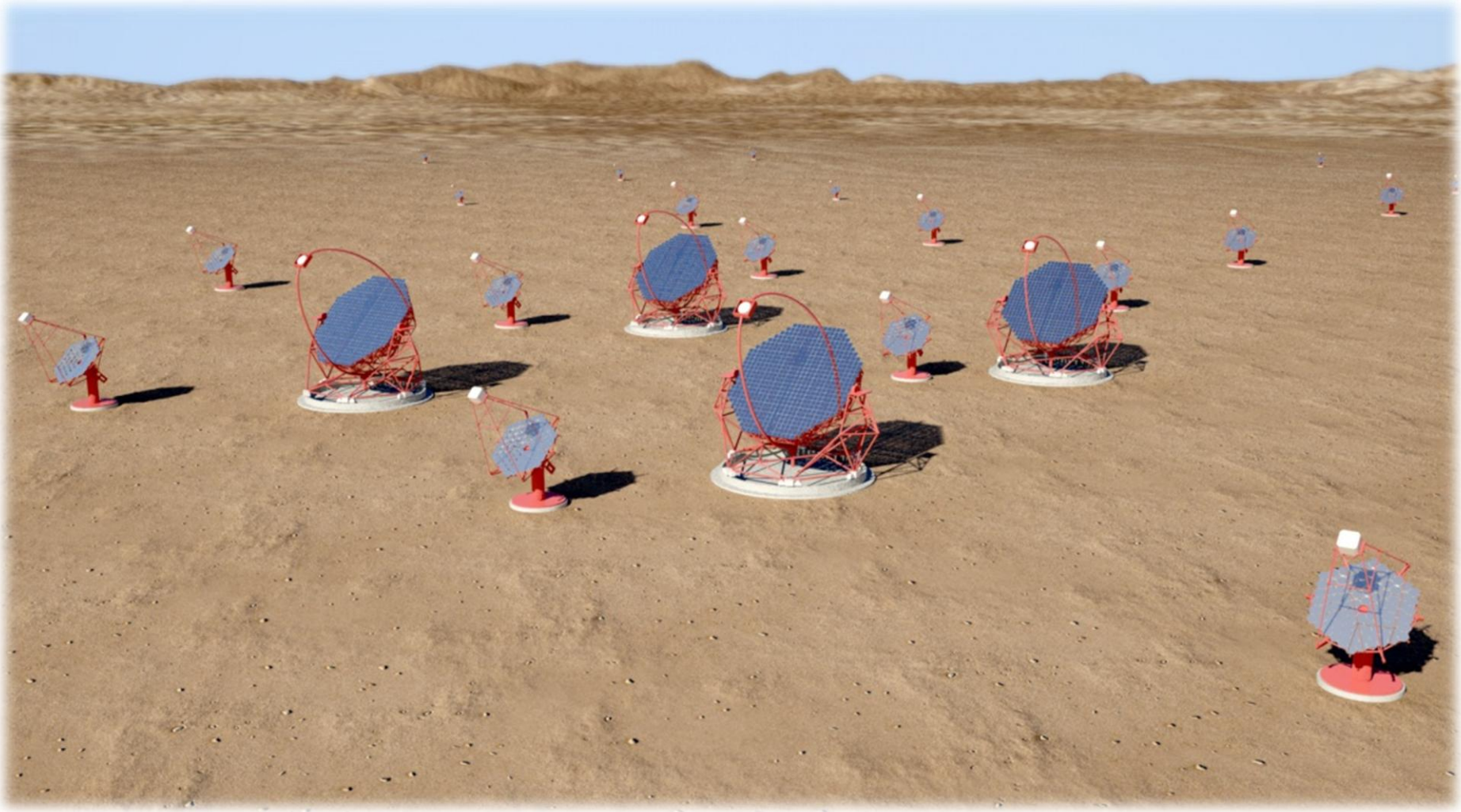
$$\theta_C = \cos^{-1}\left(\frac{1}{\beta n}\right)$$

$\beta > 1/n$

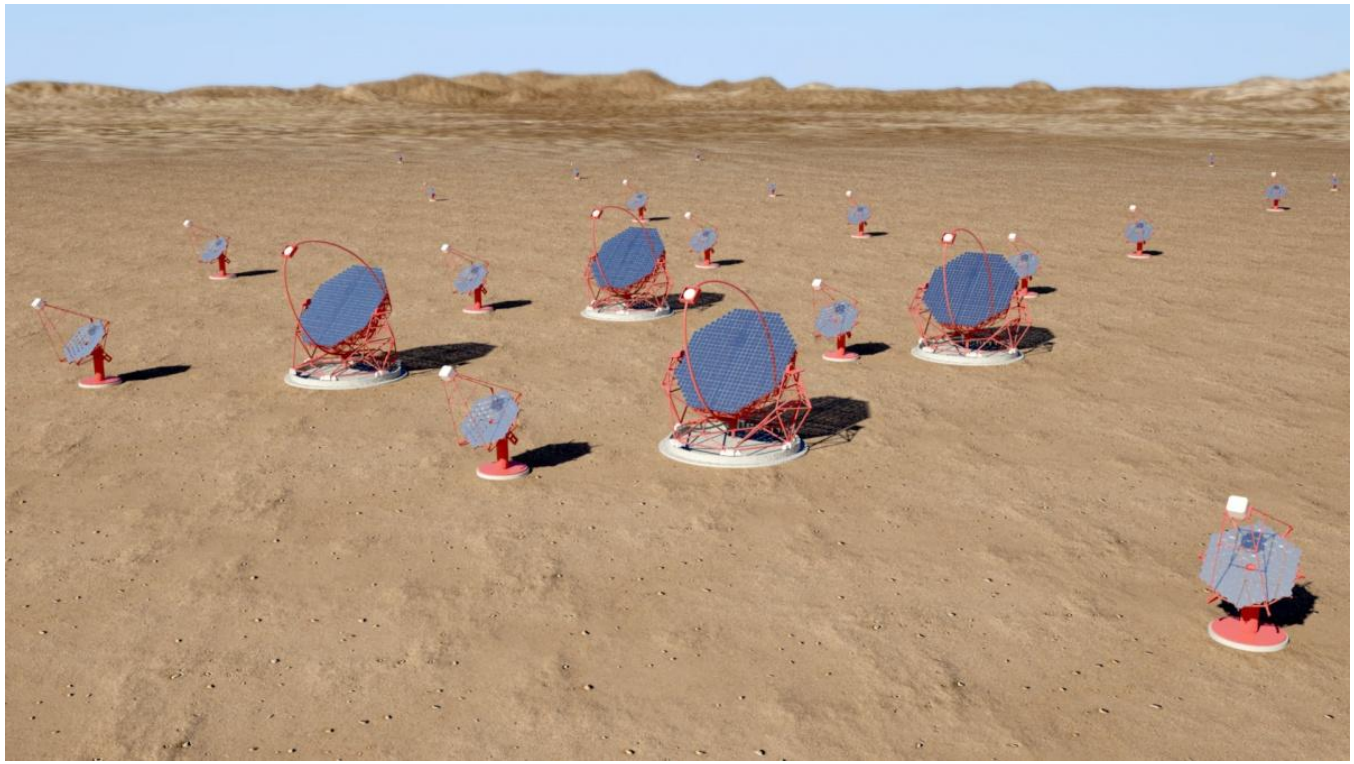




The Cerenkov Telescope Array

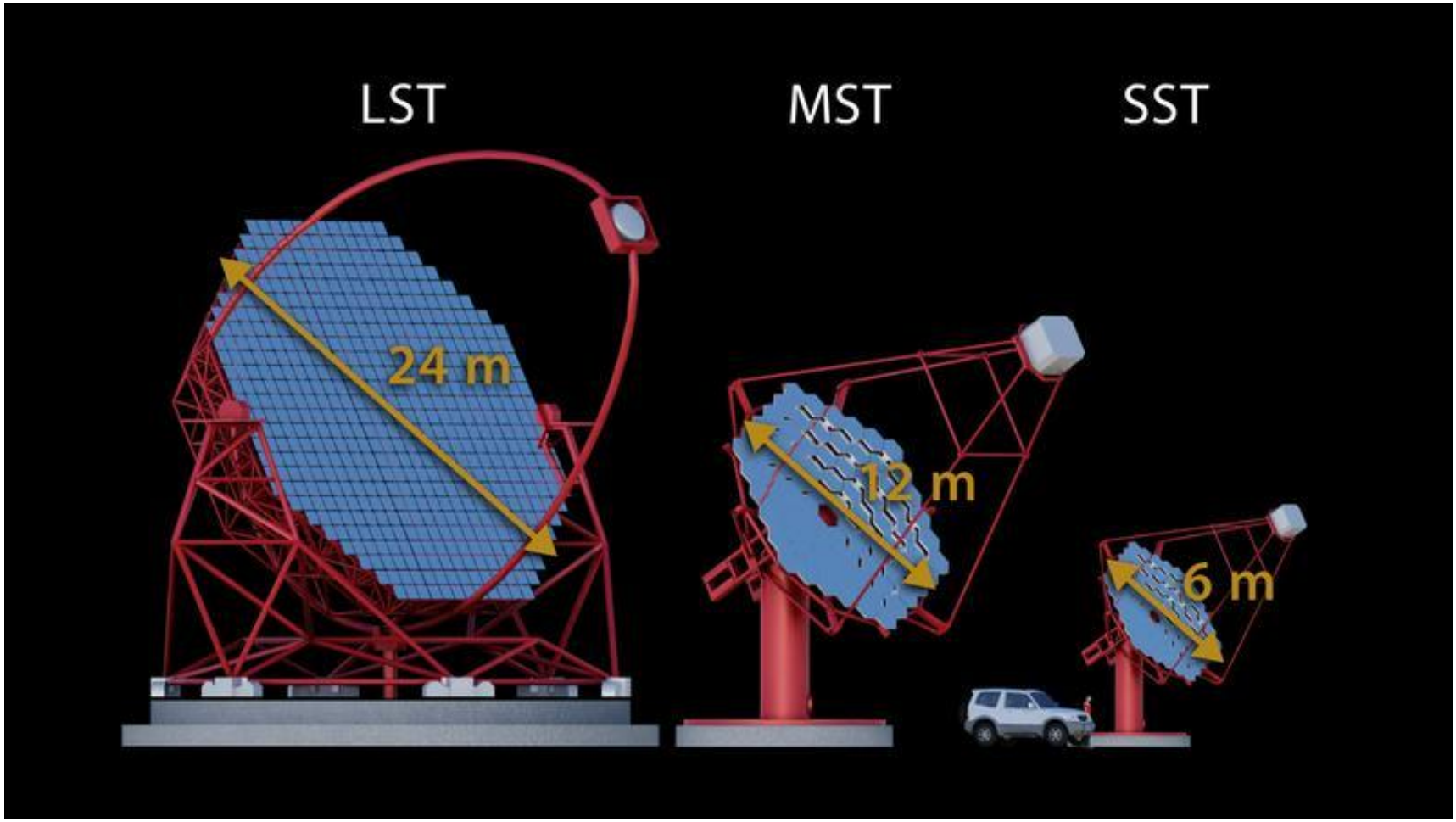


The Cerenkov Telescope Array



• 120 telescopes, located in 2 different sites: one in the northern hemisphere and one in the south.
• unprecedent sensitivity
• wide range of energy explored (HE and VHE band)

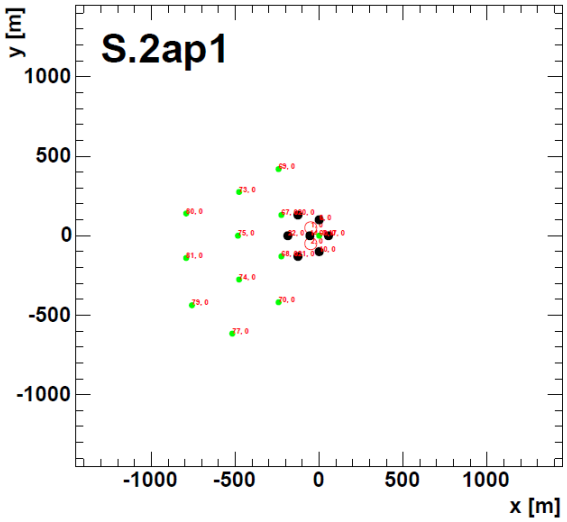
The Cerenkov Telescope Array

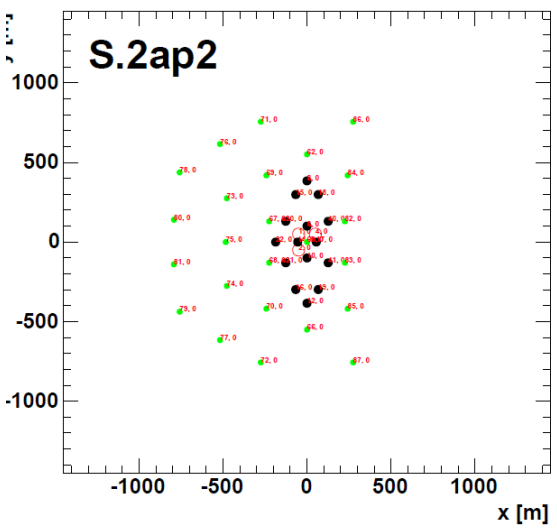


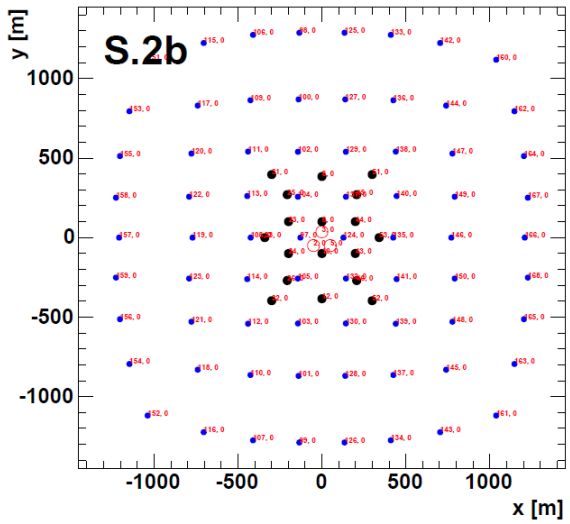
3 different sizes, corresponding to different energy ranges

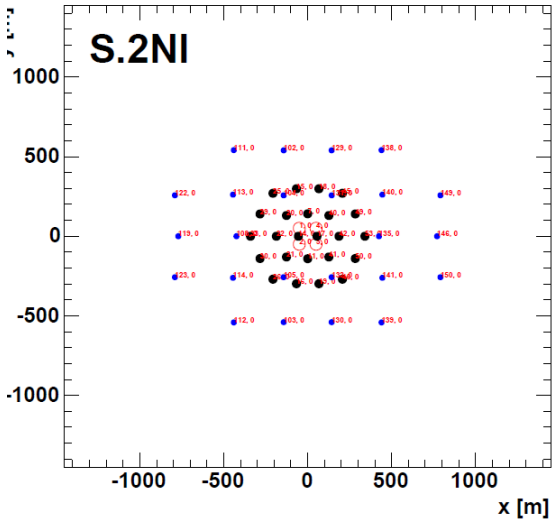
Partial Arrays

- importance of “making physics” even with an uncomplete array
- study of the performances of the partial arrays
- different configurations means different performances
- variables: number of telescopes in the partial array, size, distance between the telescopes…









Physical cases

2 potential cases for partial arrays:

MICROQUASARS

- Great variability, emission of flares in HE gamma band observed

➢ Cygnus X-1 and Cygnus X-3
➢ GRS 1915+105

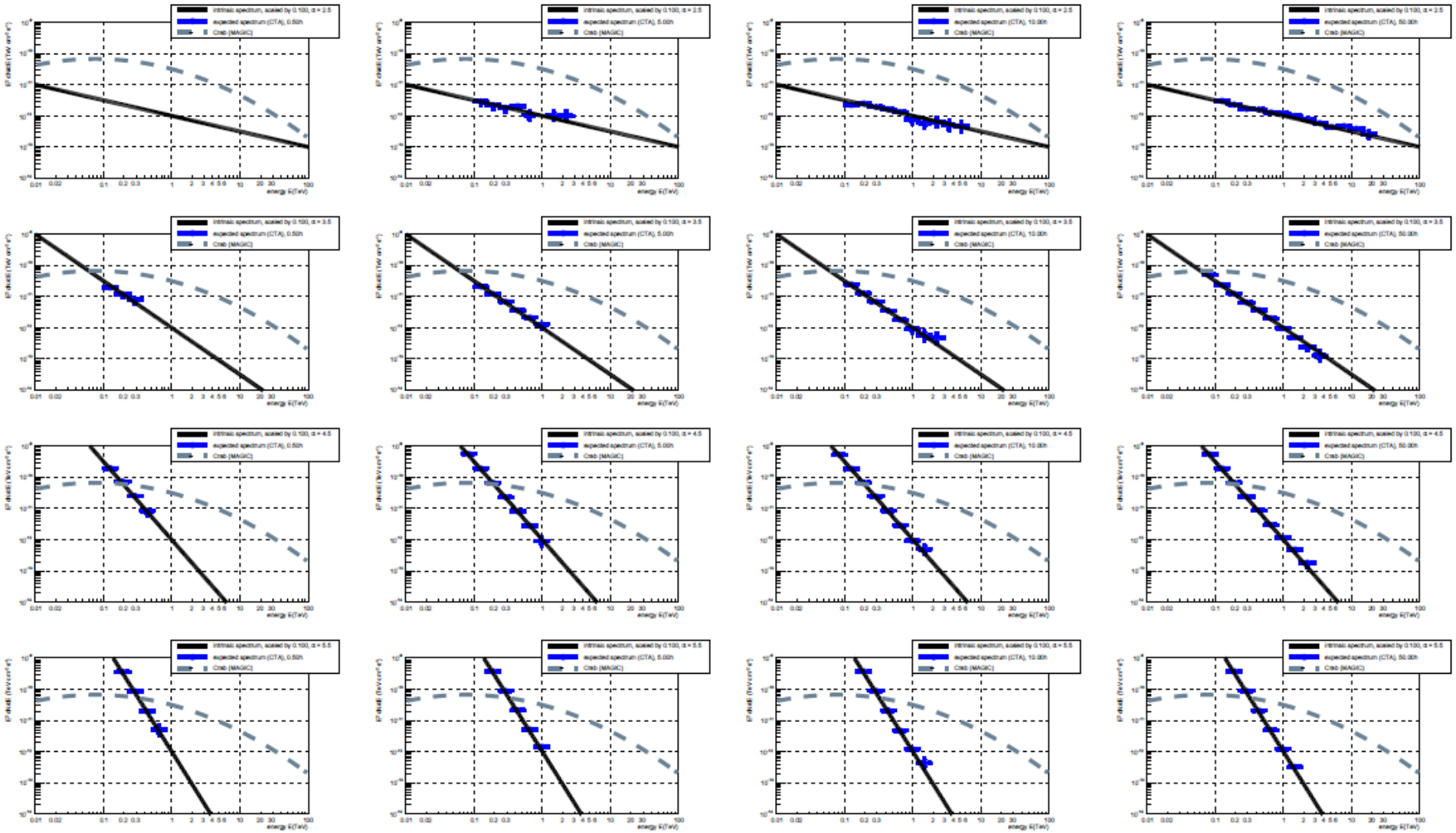
BINARIES

- Periodical variability linked to the orbital period

➢ PSR B1259 - 63/LS 2883 around the 2017 Periastron Passage
➢ LSI +61 303
➢ 1FGL J1018.6-5856

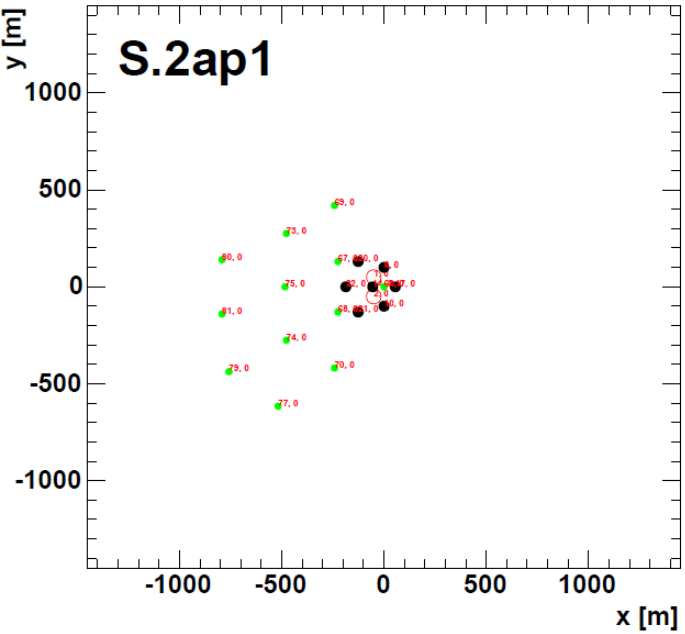
extra slides

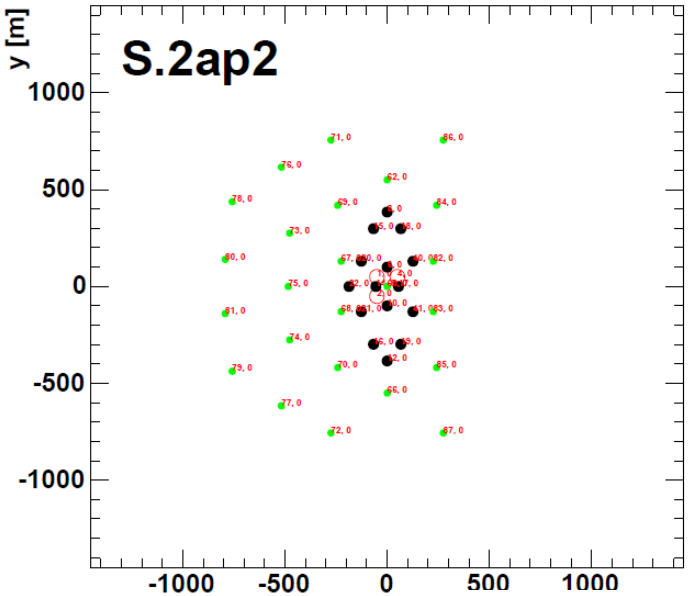
Extra slides



Simulation of a Power-law spectrum

Extra slides





Partial Arrays

Full Array