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## **FACT – Novel mirror alignment using Bokeh and enhancement of the VERITAS SCCAN alignment method**

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Imaging Air Cherenkov Telescopes, including the First G-APD Cherenkov Telescope (FACT), use segmented reflectors. These offer large and fast apertures for little resources.

However, one challenge of segmented reflectors is the alignment of the single mirrors to gain a sharp image. For Cherenkov telescopes, high spatial and temporal resolution is crucial to reconstruct air shower events induced by cosmic rays. Therefore one has to align the individual mirror positions and orientations precisely. Alignment is difficult due to the large number of degrees of freedom and because most techniques involve a star. Most current methods are limited, because they have to be done during good weather nights which overlaps with observation time. In this contribution, we will present the mirror alignment of FACT, done using two methods.

Firstly, we show a new method which we call Bokeh alignment. This method is simple, cheap and can even be done during daytime.

Secondly, we demonstrate an enhancement of the SCCAN method by F. Arqueros et al., and first implemented by the McGill VERITAS group. Using a second camera, our enhanced SCCAN is optimized for changing weather, changing zenith distance, and changing reference stars.

Developed off site in the lab on a 1/10th scale model of FACT, both our alignment methods resulted in a highly telescope independent procedure, e.g. both our methods run without communication to the telescope's drive.

We compare alignment results by using the point spread function of star images, ray tracing simulations, and overall muon rates before and after the alignment.

### **Collaboration**

FACT

### **Registration number following "ICRC2015-I"**

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