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## Using UV-pass filters for bright Moon observations with MAGIC

*Saturday 1 August 2015 15:30 (1 hour)*

MAGIC is a system of two Imaging Atmospheric Cherenkov Telescopes (IACT) that observe Very High Energy (VHE) gamma ray sources. The PMTs in their cameras are designed to operate under moonlight, but they are limited to Moon phases below 93% (300 Moon hours per year), as they can get damaged if the amount of light they receive is too high. As a result, they cannot be used 2-3 days before and after Full Moon. We have selected commercial inexpensive UV-pass filters rejecting light above a wavelength of 420 nm, where the moonlight intensity is stronger. We mounted them on light-weight frames that can be easily installed on the telescope cameras. Test observations have been performed during the last nine months, from which a moonlight transmission of about 20% and a Cherenkov light transmission of about 45% are estimated. This allows the observation of sources down to an angular distance of 5 degrees to the Moon during Full Moon: essentially in the whole sky and all possible moonlight conditions. Therefore, we can record 700 more Moon hours per year and extend the duty cycle of MAGIC by about 50%, including nights when VHE observations with IACTs are currently not feasible. Especially interesting is the possibility to observe the deficit in the cosmic ray flux produced by the presence of the Moon (the so-called "Moon shadow"). Here we evaluate the performance, in terms of sensitivity and energy threshold, of the MAGIC telescopes equipped with the UV filter under different moonlight intensities, as inferred from Crab Nebula observations and Monte Carlo simulations.

### Collaboration

MAGIC

### Registration number following "ICRC2015-I"

62

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