



Contribution ID: 702

Type: Parallel Talk

## Search for Gamma-ray Spectral Line emission from Dark Matter Annihilation up to 100 TeV towards the Galactic Centre with MAGIC

*Friday, 8 July 2022 14:50 (20 minutes)*

The detection of line-like TeV gamma-ray features configures as a smoking gun for the discovery of TeV-scale particle dark matter. We report the first search for dark matter spectral lines in the Galactic Centre region up to gamma-ray energies of 100 TeV with the MAGIC telescopes, located on the Canary island of La Palma (Spain). This region is expected to host the most easily detectable dark matter halo due to its size and proximity and is therefore well suited for this kind of search. Observations at large-zenith angles significantly increase the telescopes' collection area and sensitivity for gamma rays in the TeV regime. We present the results obtained with more than 200 hours of large-zenith angle observations of the Galactic Centre region with MAGIC, which allow us to obtain competitive limits to the dark matter annihilation cross-section at heavy particle masses ( $\langle\sigma v\rangle < 5 \times 10^{-28} \text{ cm}^3 \text{ s}^{-1}$  at 1 TeV and  $\langle\sigma v\rangle < 1 \times 10^{-25} \text{ cm}^3 \text{ s}^{-1}$  at 100 TeV), improving the best current constraints above 20 TeV. In addition, we also study the impact of an inner cored dark matter halo on the probing of the annihilation cross-section as a conservative scenario. Finally, we use the derived limits to constrain super-symmetric wino models.

### In-person participation

Yes

**Primary author:** Dr INADA, Tomohiro (ICRR, UTokyo)**Co-authors:** Dr KERSZBERG, Daniel (IFAE-BIST); Dr HÜTTEN, Moritz (ICRR, UTokyo); Prof. TESHIMA, Masahiro (ICRR, UTokyo/Max-Planck-Institute for Physics, Munich); Dr RICO, Javier (IFAE-BIST); Prof. KOHRI, Kazunori (KEK); Dr HIROSHIMA, Nagisa (University of Toyama, RIKEN iTHEMS)**Presenter:** Dr INADA, Tomohiro (ICRR, UTokyo)**Session Classification:** Dark Matter**Track Classification:** Dark Matter