



Contribution ID: 59

Type: Oral contribution

## Discovery of very-high-energy gamma-ray emission from a hard-X-ray bright HBL RX J1136.5+6737

Thursday 30 July 2015 11:30 (15 minutes)

RX J1136.5+6737 ( $z=0.1342$ ) is a hard X-ray bright high-peaked frequency BL Lac object as listed in the MAXI 3-year catalog as well as the Swift-BAT catalog. The source has also been detected by Fermi-LAT with a hard photon index of  $1.68 \pm 0.12$ , and belongs to the first Fermi-LAT catalog of  $> 10$  GeV sources, showing bright (photon flux =  $11.7 \times 10^{-11}$  ph cm $^{-2}$  s $^{-1}$ ) emission above 10 GeV. MAGIC observed the source for about 30 hours in 2014 and discovered very-high-energy (VHE) gamma-ray emission from the source with  $> 5\sigma$  significance. The averaged flux measured by MAGIC during the 2014 observations corresponds to about 1.5% of the Crab Nebula flux at energies above 200 GeV without significant variability. The measured spectrum shows evidence of extending into the TeV energy range, even though most extragalactic background light models predict the distance of  $z=0.1342$  is beyond the “Cosmic gamma-ray horizon” at 1 TeV. Along with the MAGIC observations, we coordinated simultaneous multi-band observations in X-ray and UV bands by Swift, and in optical-IR bands by ground-based telescopes such as Kanata and KVA. In this contribution, the first results of the MAGIC discovery of VHE emission from RX J1136.5+6737 will be reported. We will also discuss origins of the gamma-ray emission with a broad-band spectral energy distribution using our emission model, which takes into account secondary gamma-ray photons produced from cascades induced by ultra-high-energy gamma-ray or protons propagating through intergalactic space.

### Collaboration

MAGIC

### Registration number following ”ICRC2015-I”

81

**Primary author:** Dr HAYASHIDA, Masaaki (Institute for Cosmic-Ray Research, University of Tokyo)

**Co-authors:** Dr TAKAMI, Hajime (KEK); Dr ITOH, Ryosuke (Hiroshima University); Mr KONNO, Yusuke (Kyoto University)

**Presenter:** Dr HAYASHIDA, Masaaki (Institute for Cosmic-Ray Research, University of Tokyo)

**Session Classification:** Parallel GA01 EGAL

**Track Classification:** GA-EX