

Very High Energy gamma-ray detection by MAGIC from a direction coincident with the IceCube neutrino event



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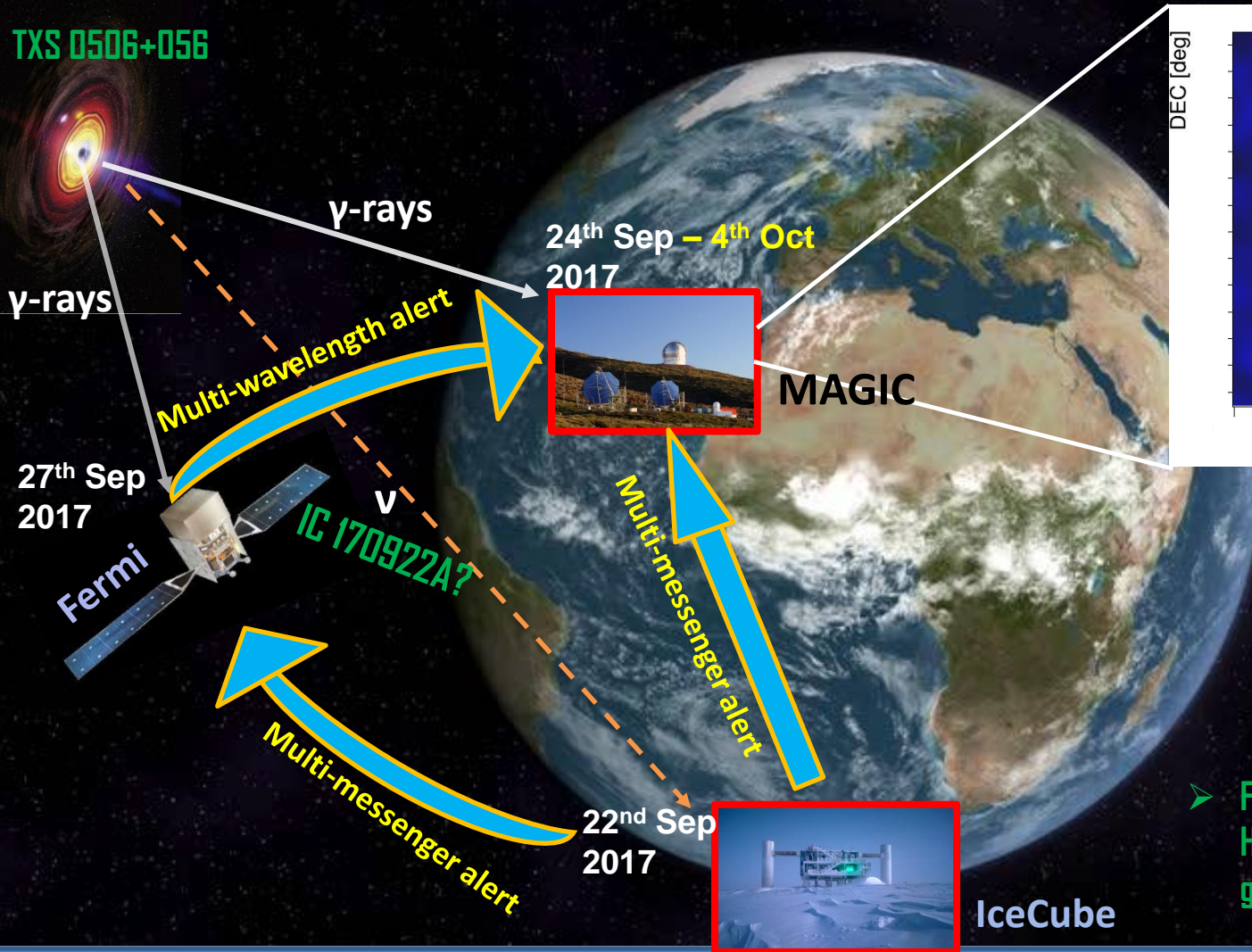
4th June, 2018

Wrijupan Bhattacharyya, DESY



MAGIC detection of VHE gamma-rays from TXS 0506+056

TXS 0506+056

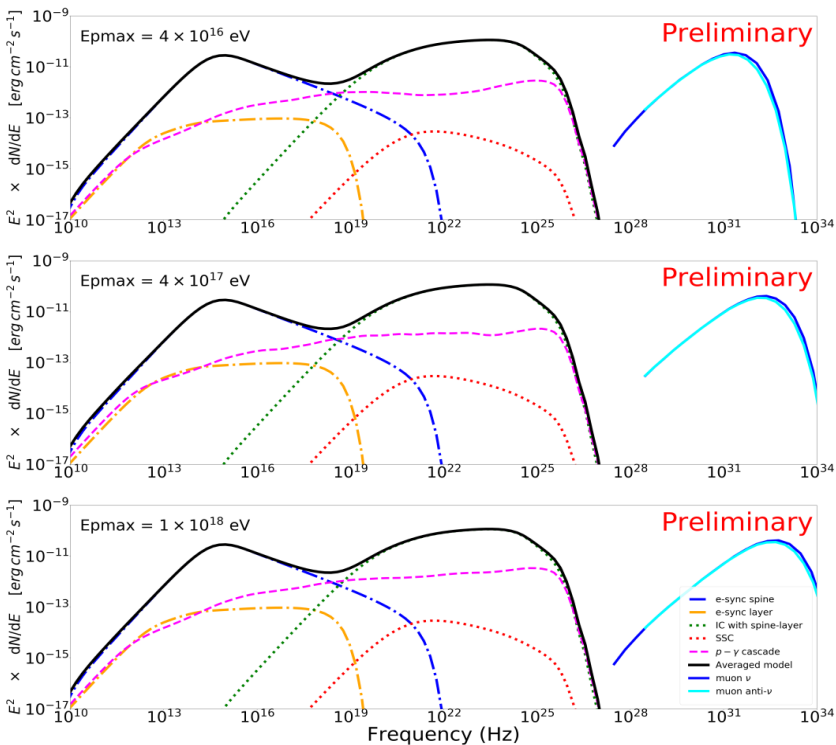


- 12 h of good quality MAGIC data
- Detection of TXS 0506+056 in the VHE band with significance $> 5 \sigma$ (ATel #10817)
- First potential association of a HE neutrino event with a VHE gamma-ray source

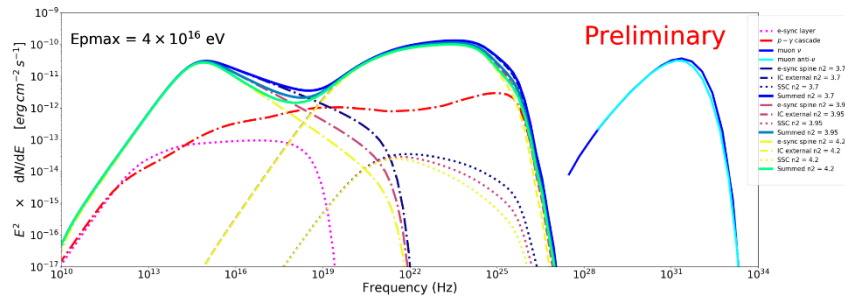
Interpretation of the broadband electromagnetic and neutrino observations of TXS 0506+056

- Assumption - A genuine association of the observed neutrino and blazar flare.
- Model – Spine-layer lepto-hadronic model, where the jet is composed of two regions with different speeds

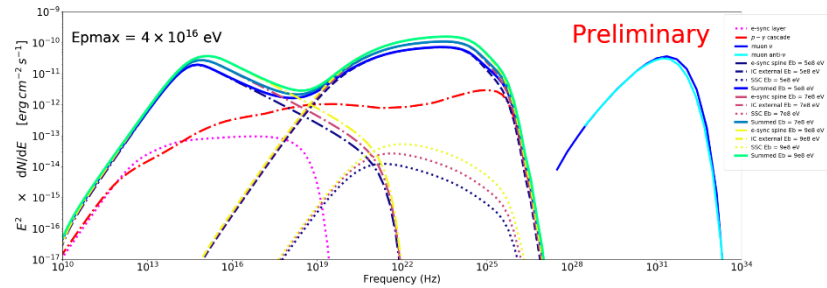
TXS0506+056 SED ($E_{\text{pmax}} = 4 \times 10^{16} \text{ eV} - 1 \times 10^{18} \text{ eV}$)



TXS0506+056 SED (spectral index $n_2 = 3.7 - 4.2$)



TXS0506+056 SED ($E_{\text{break}} = 5 \times 10^8 - 9 \times 10^8 \text{ eV}$)



- Self-consistent interpretation of EM + ν
- Broadband SED predominantly leptonic with non-negligible hadronic signature in the X-ray and VHE band