

# Gamma-ray signatures of cosmic ray interactions in AGN



RUB

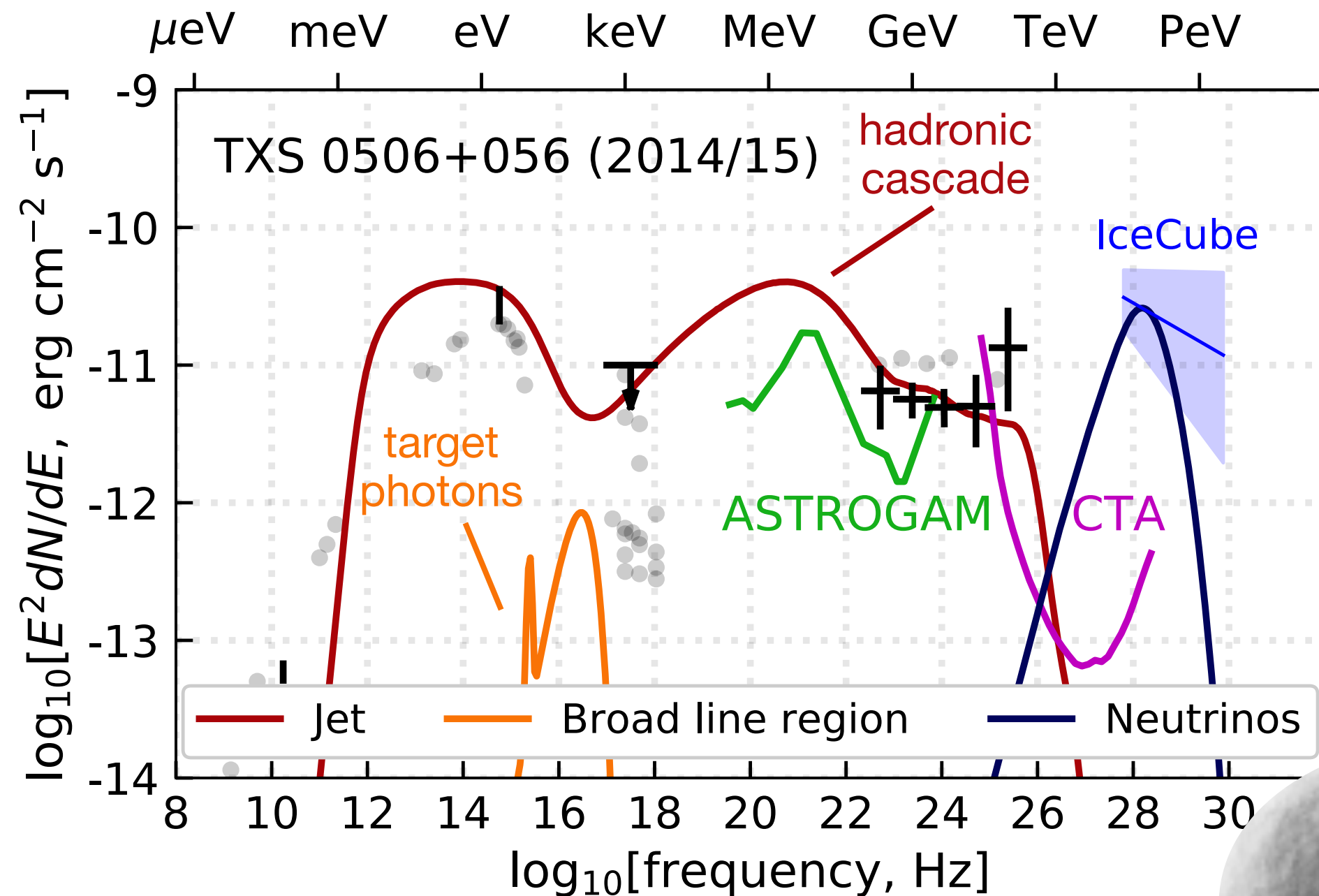
Xavier Rodrigues

DESY Zeuthen, Ruhr University Bochum

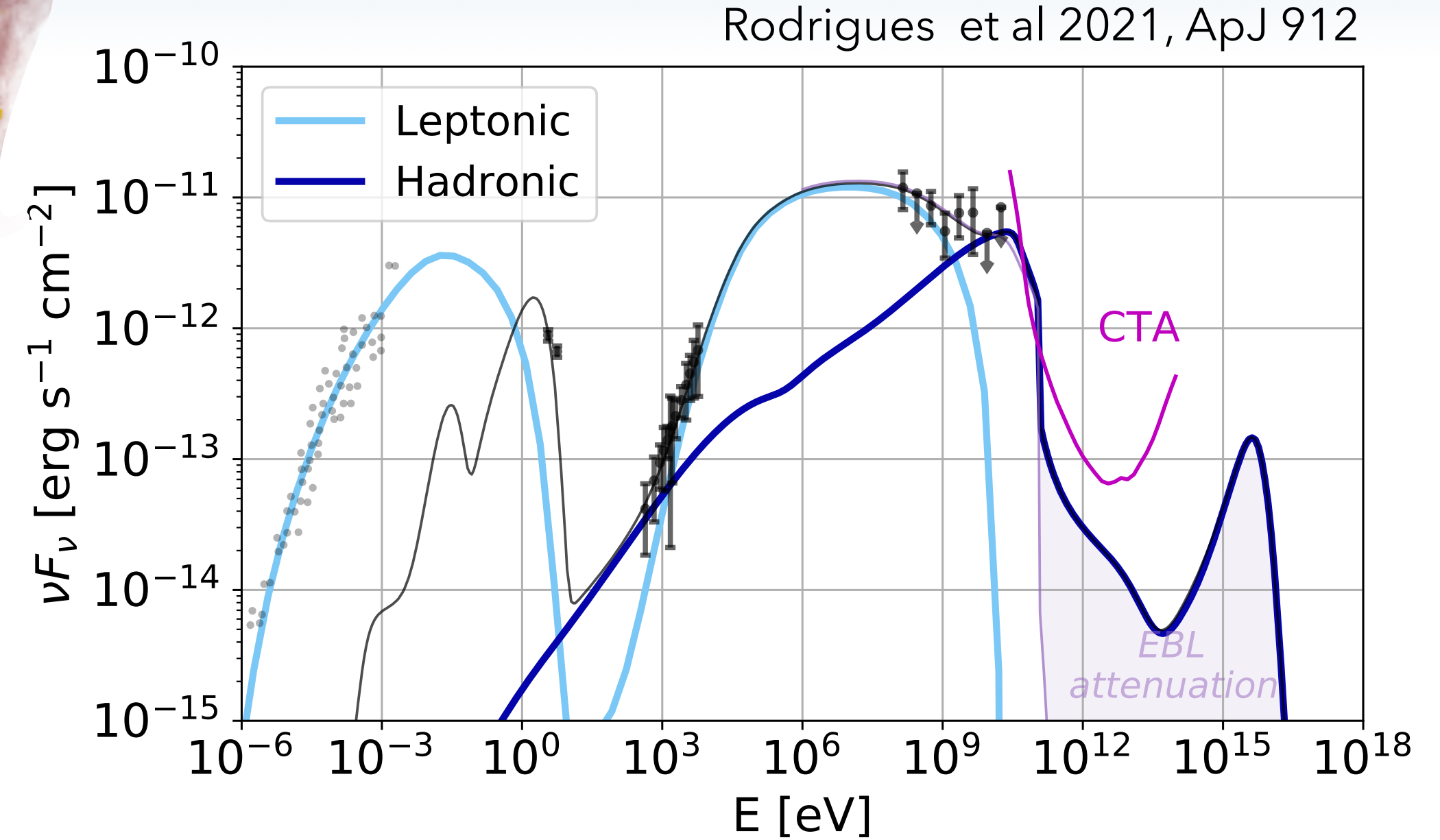
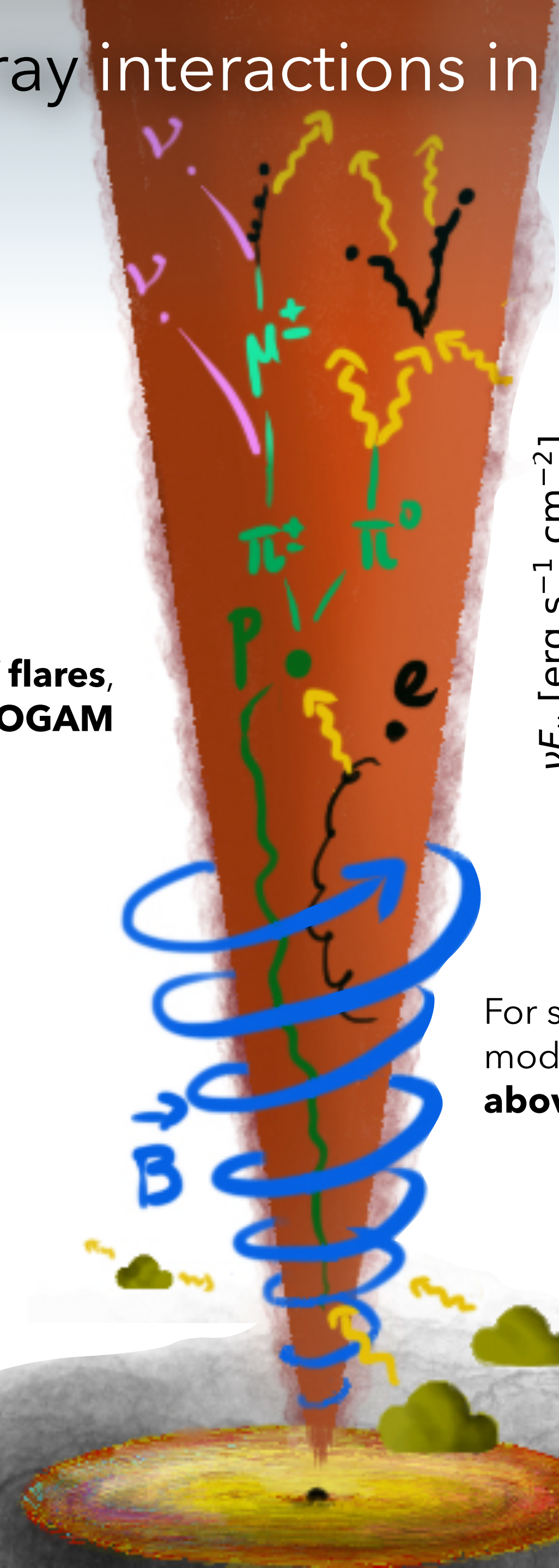
Numerical modeling suggests that in some blazars, cosmic rays interact with hot thermal photons near the core.

These photons act as targets for neutrino production, **attenuate GeV gamma rays**, and trigger EM cascades

**Neutrinos** should then **correlate with bright MeV flares**, for which we need an instrument like **ASTROGAM**



Rodrigues et al 2019, ApJL 874



Rodrigues et al 2021, ApJ 912

For some other AGNs associated with IceCube events, models show that neutrino production may lead to flares **above ~10 GeV**

CTA may be able to detect such flares, even from **extremely distant sources** like PKS 1502+106 at  $z=1.83$  (figure above).

To constrain neutrino emission from these sources we will need **CTA follow-up observations** and cross-correlation studies with **X-ray instruments**