Understanding high-energy emission processes in blazar jets through X-ray Polarization

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In collaboration with A. L. Peirson and R. W. Romani

Finnish Center for Astronomy with ESO
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Extragalactic jets on all scales
launching, propagation, termination
June 2021

Turun yliopisto
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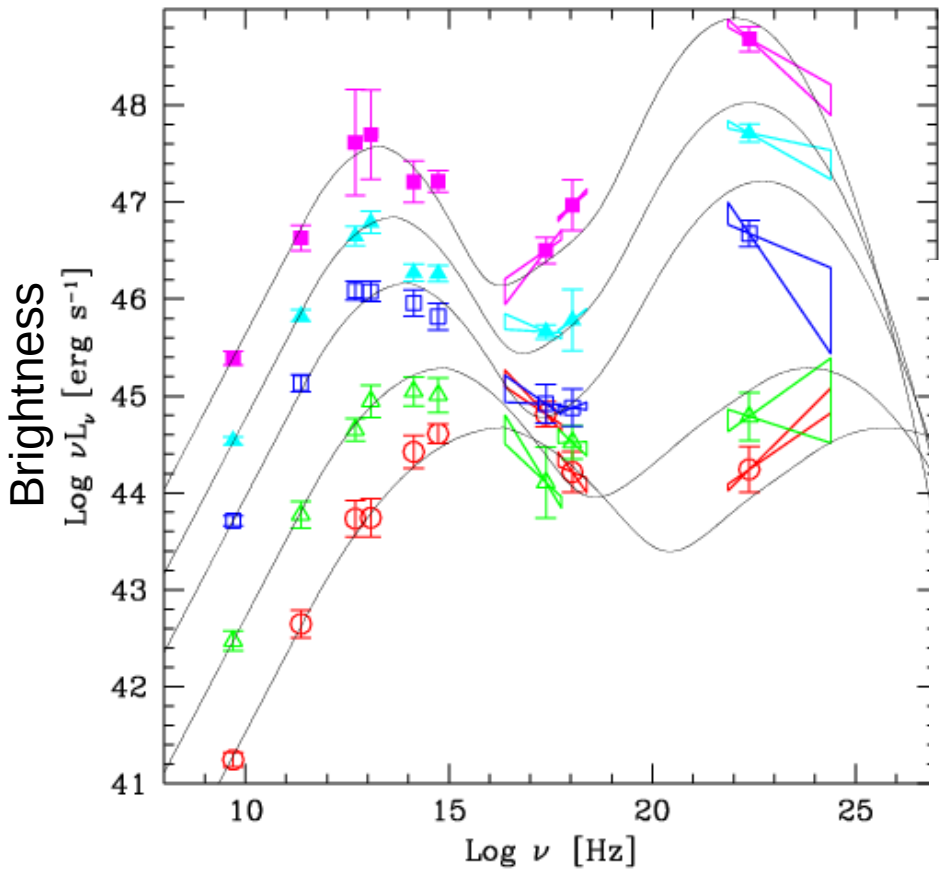
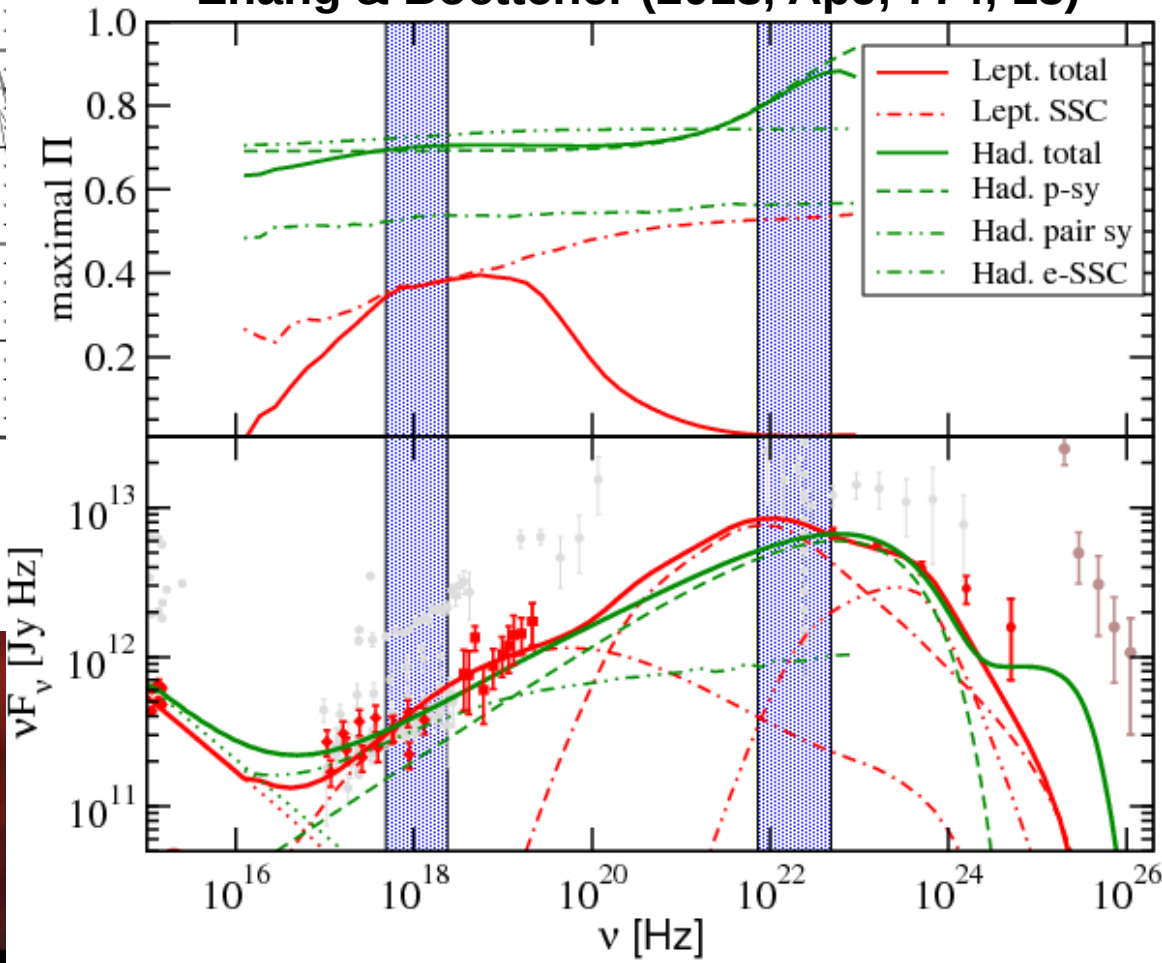
Where is the high-energy emission coming from?



Frequency

3C279

Zhang & Boettcher (2013, ApJ, 774, 18)



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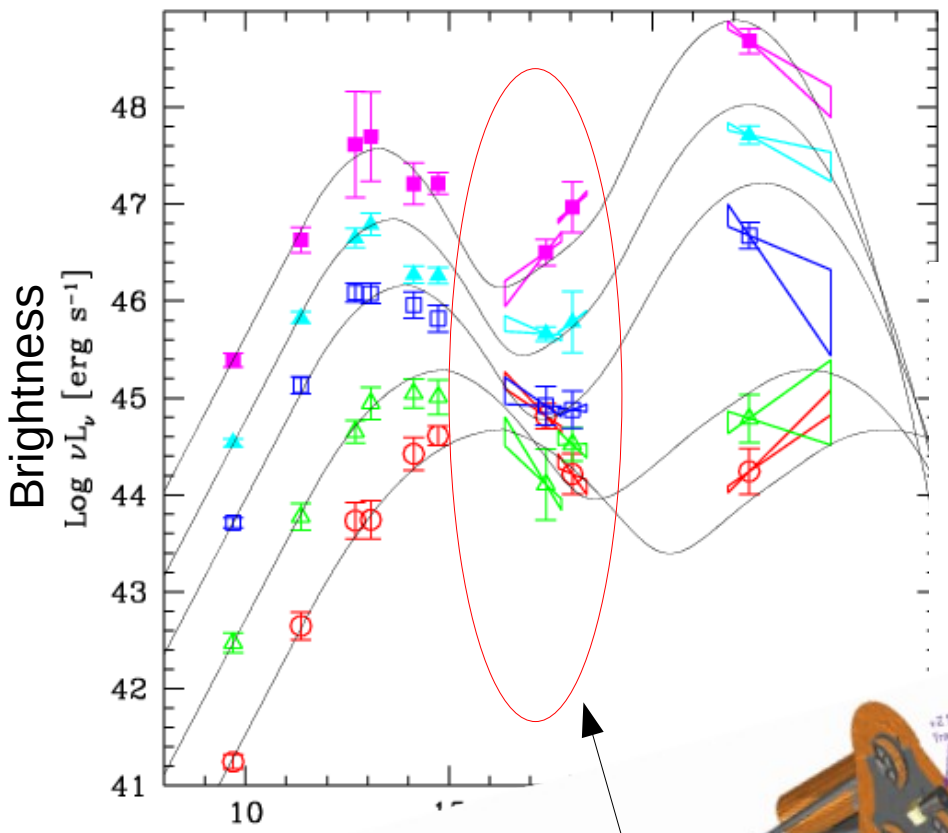

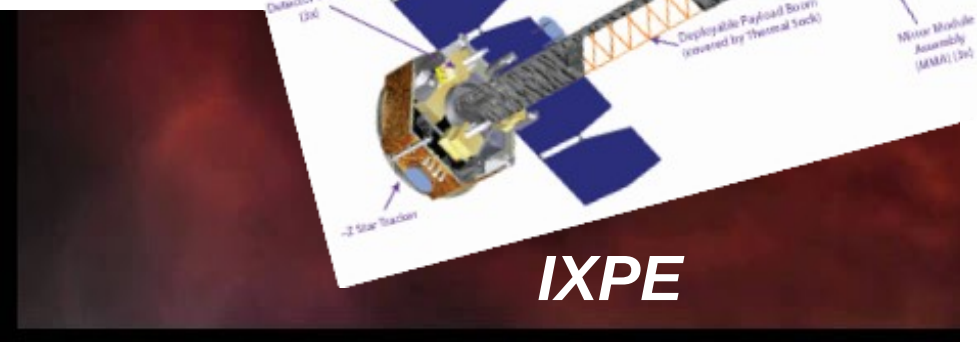

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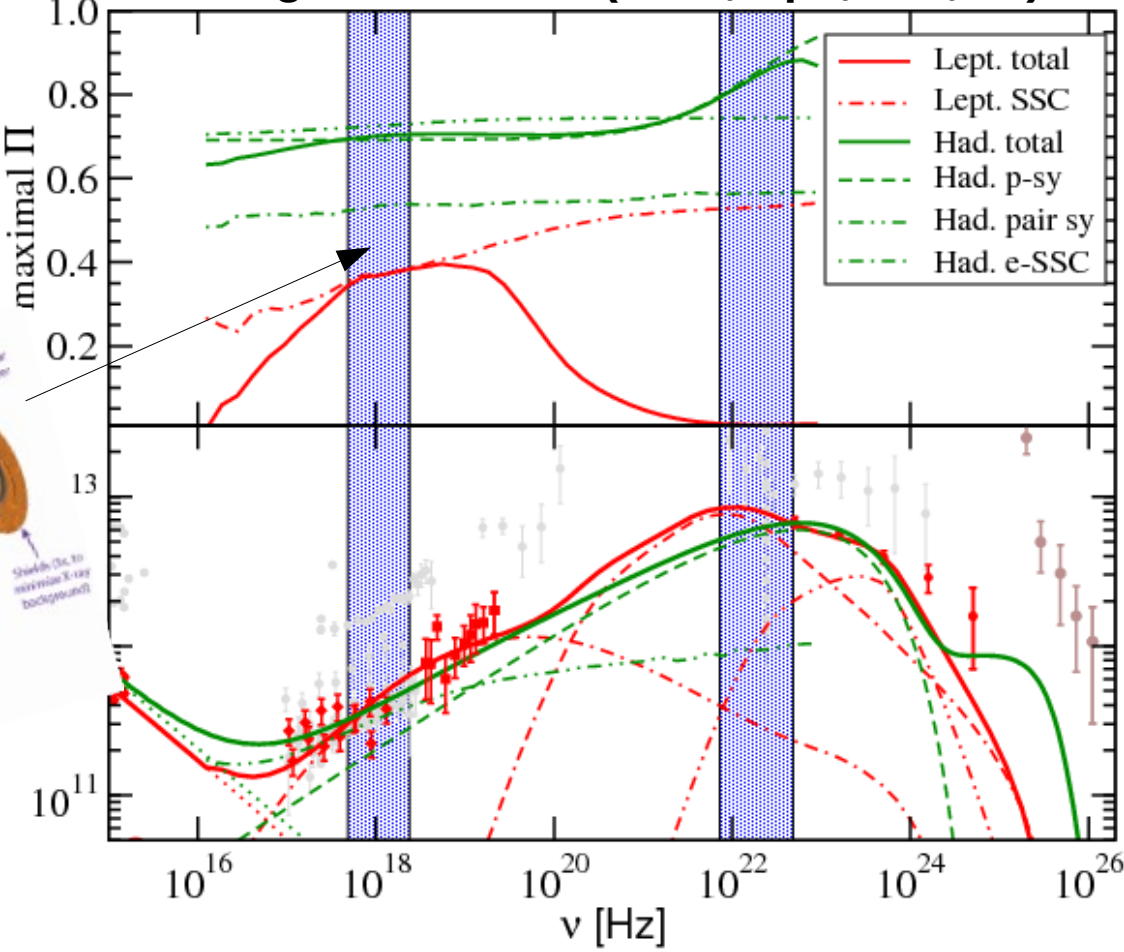

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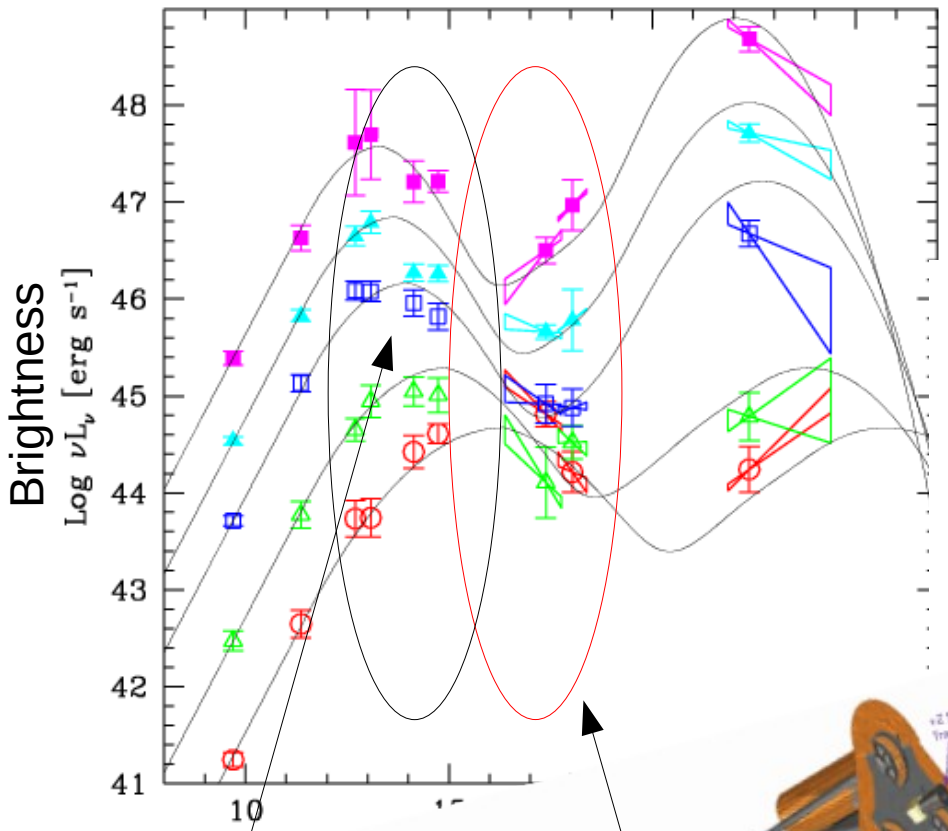

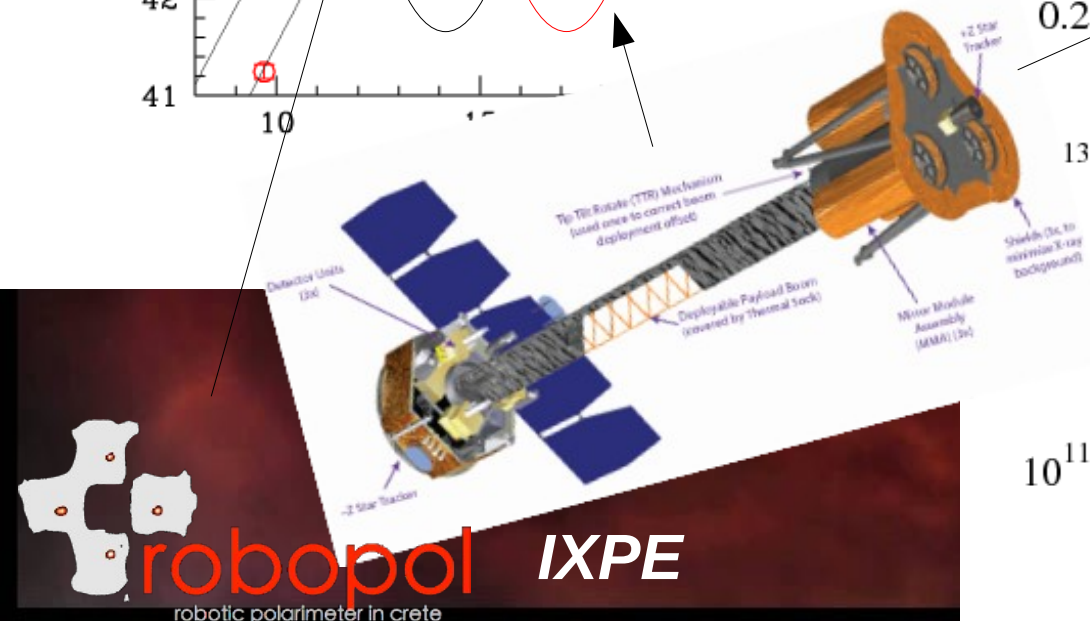

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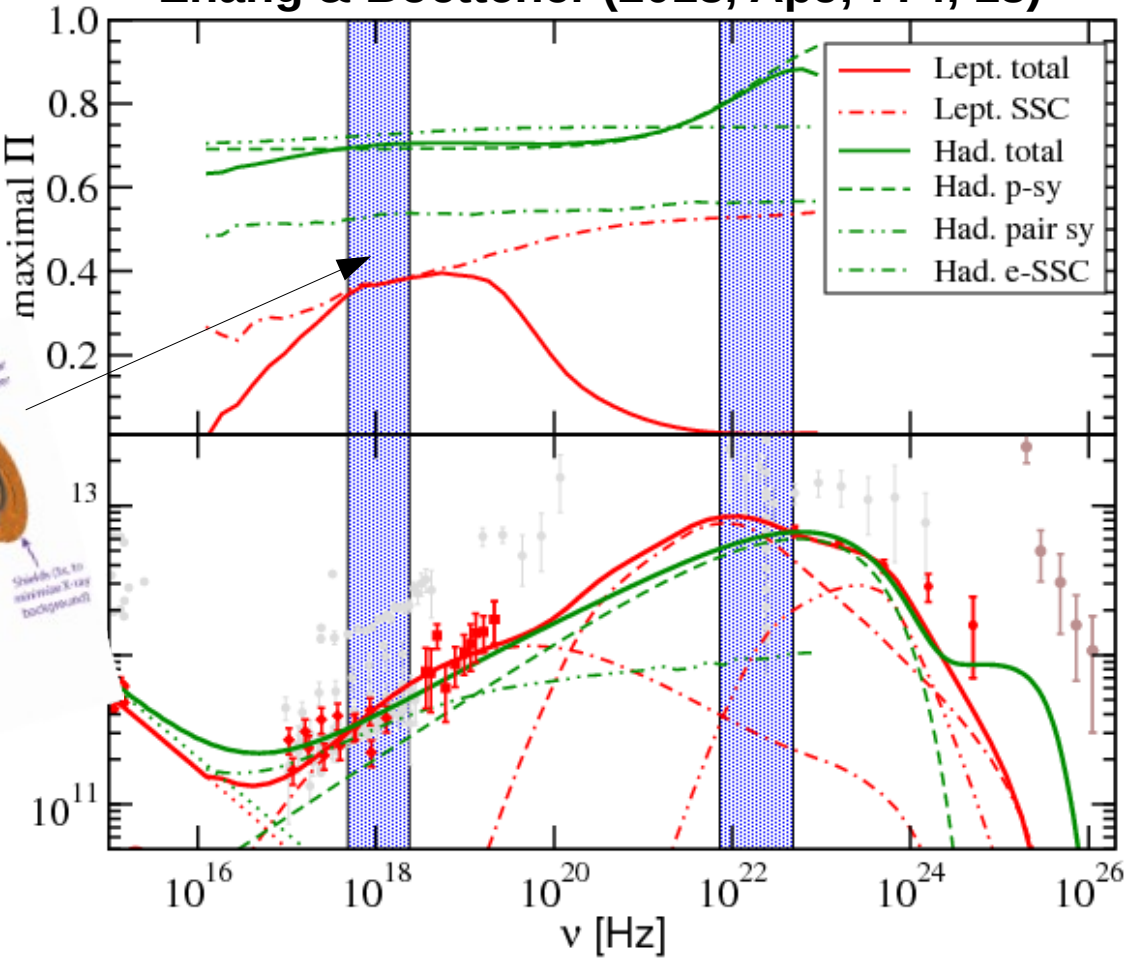
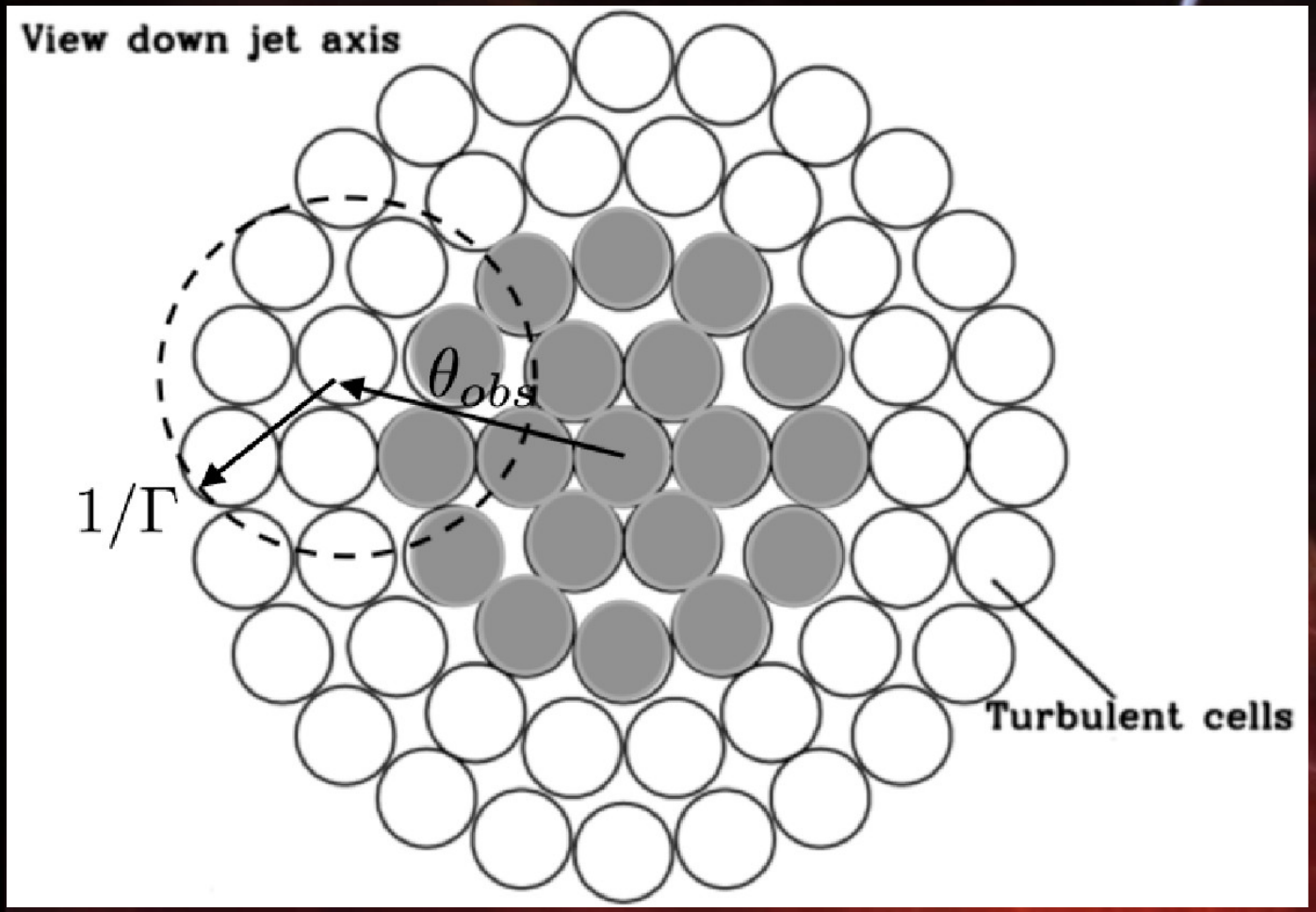


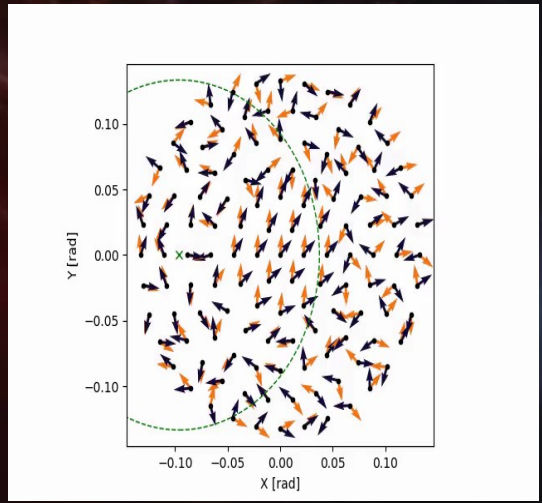
Jet model and polarization predictions



Lawrence Peirson

Marscher (2014,arXiv:1311.7665)
Peirson & Romani (2018,arXiv:1807.10732)

$$\Pi_{obs} = \Pi_{max} / \sqrt{N}$$



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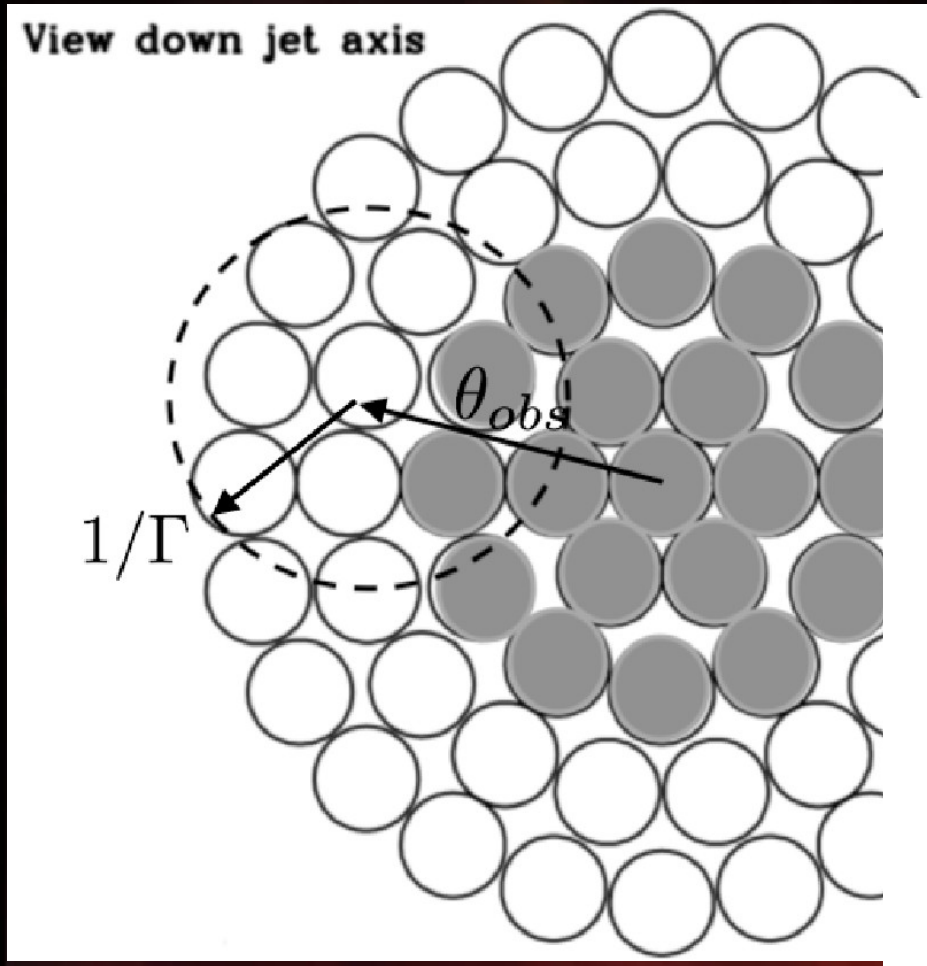

Marscher (2014,arXiv:1311.7665)
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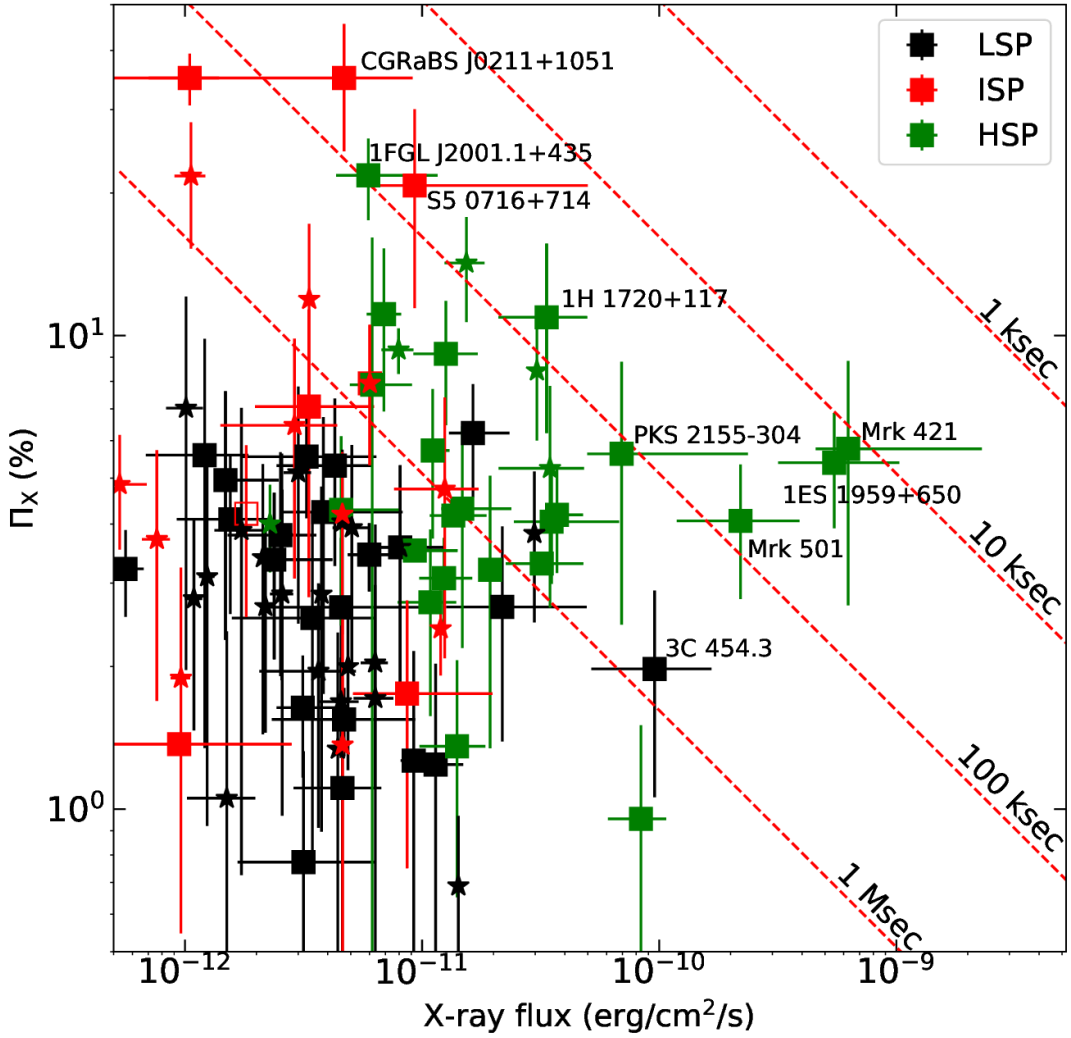
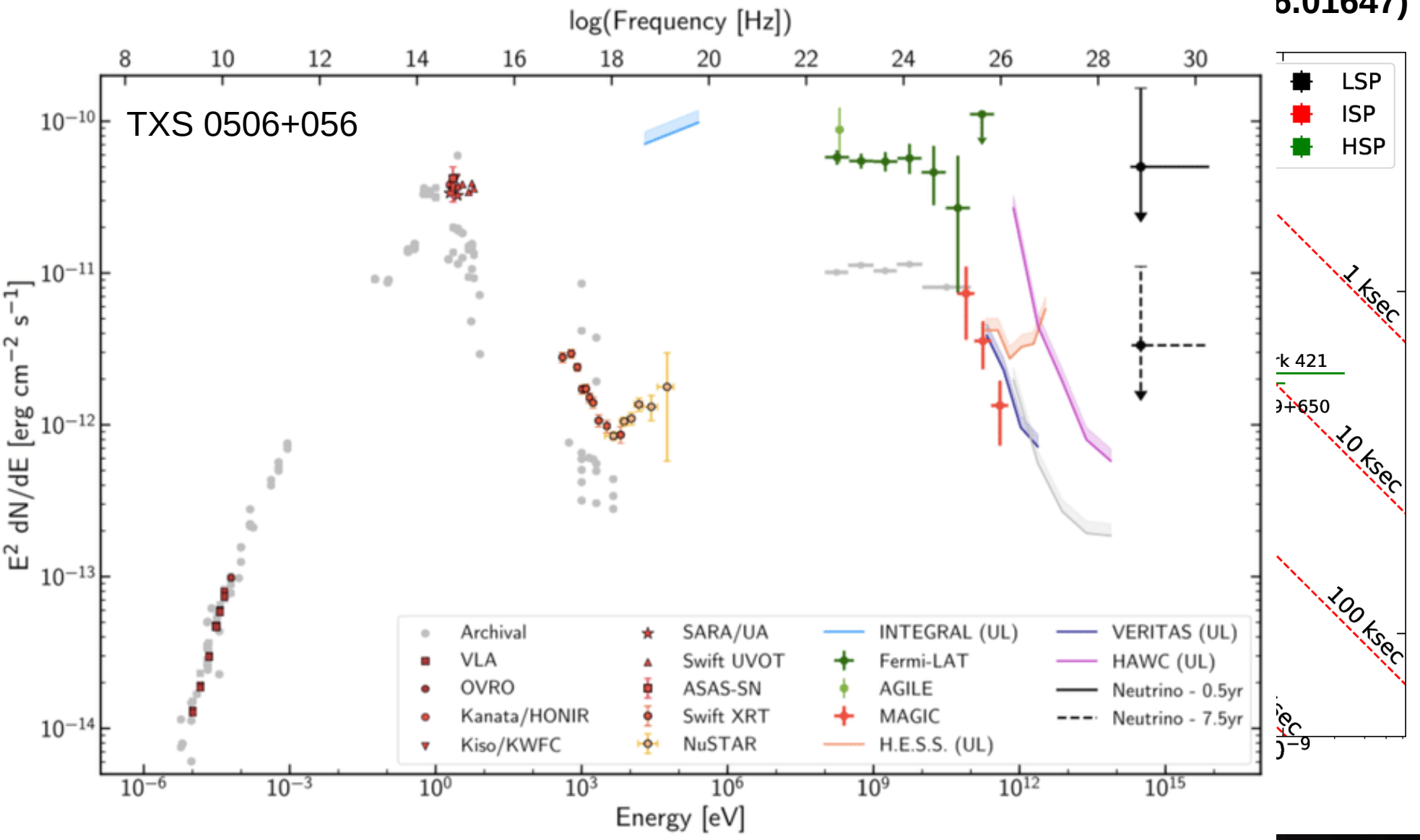
Liodakis et al (2019, arXiv:1906.01647)



Jet model and polarization predictions

6.01647)



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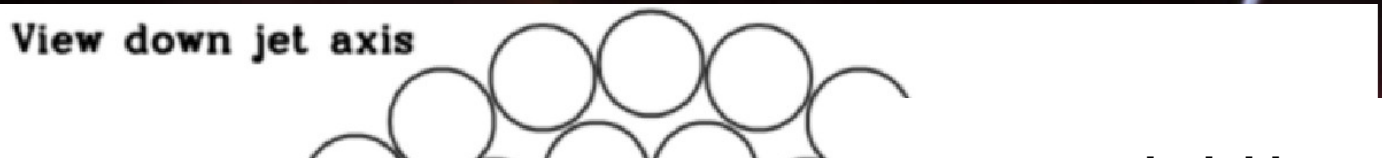

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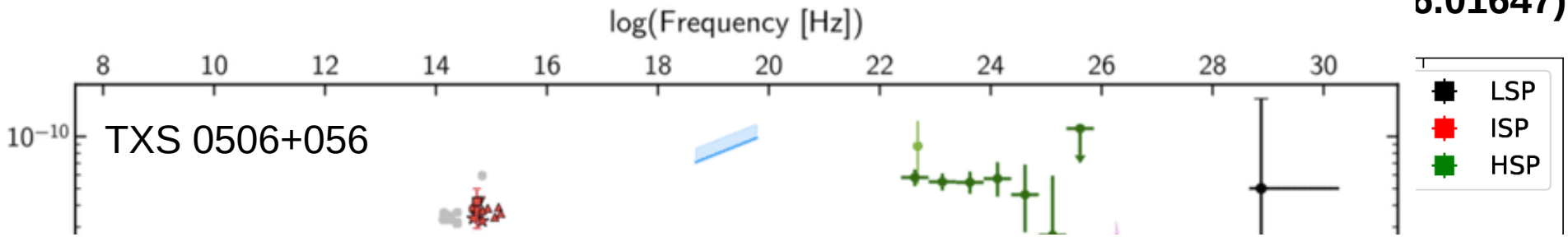

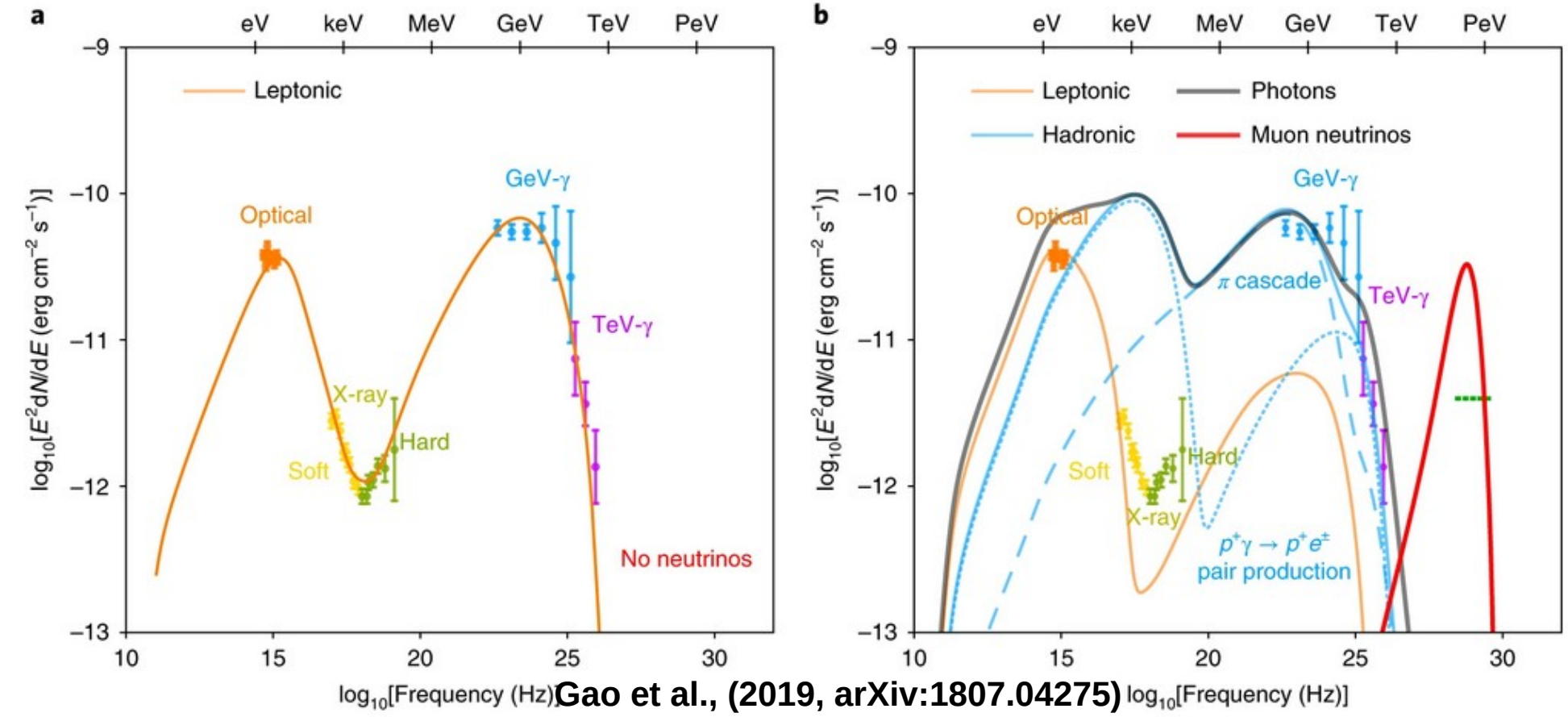

Gao et al., (2019, arXiv:1807.04275)

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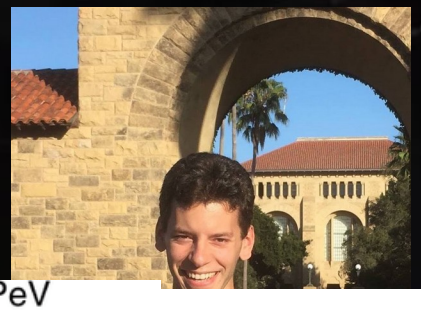
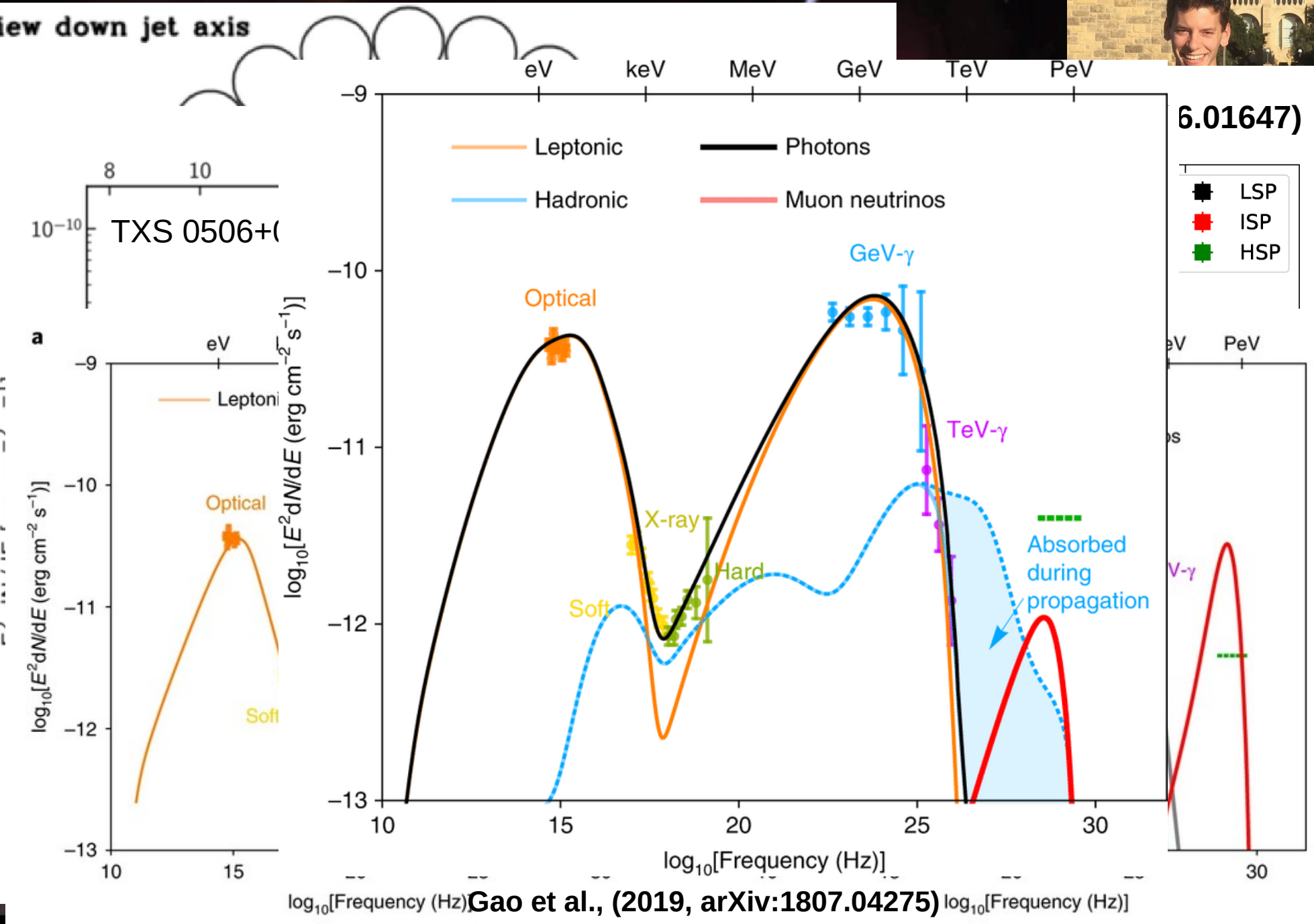


View down jet axis

6.01647)



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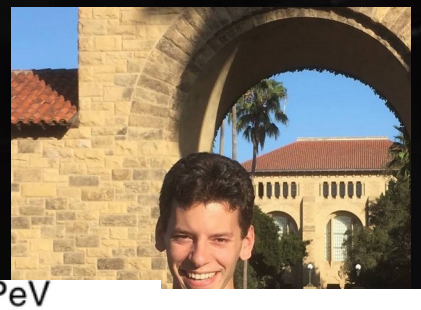

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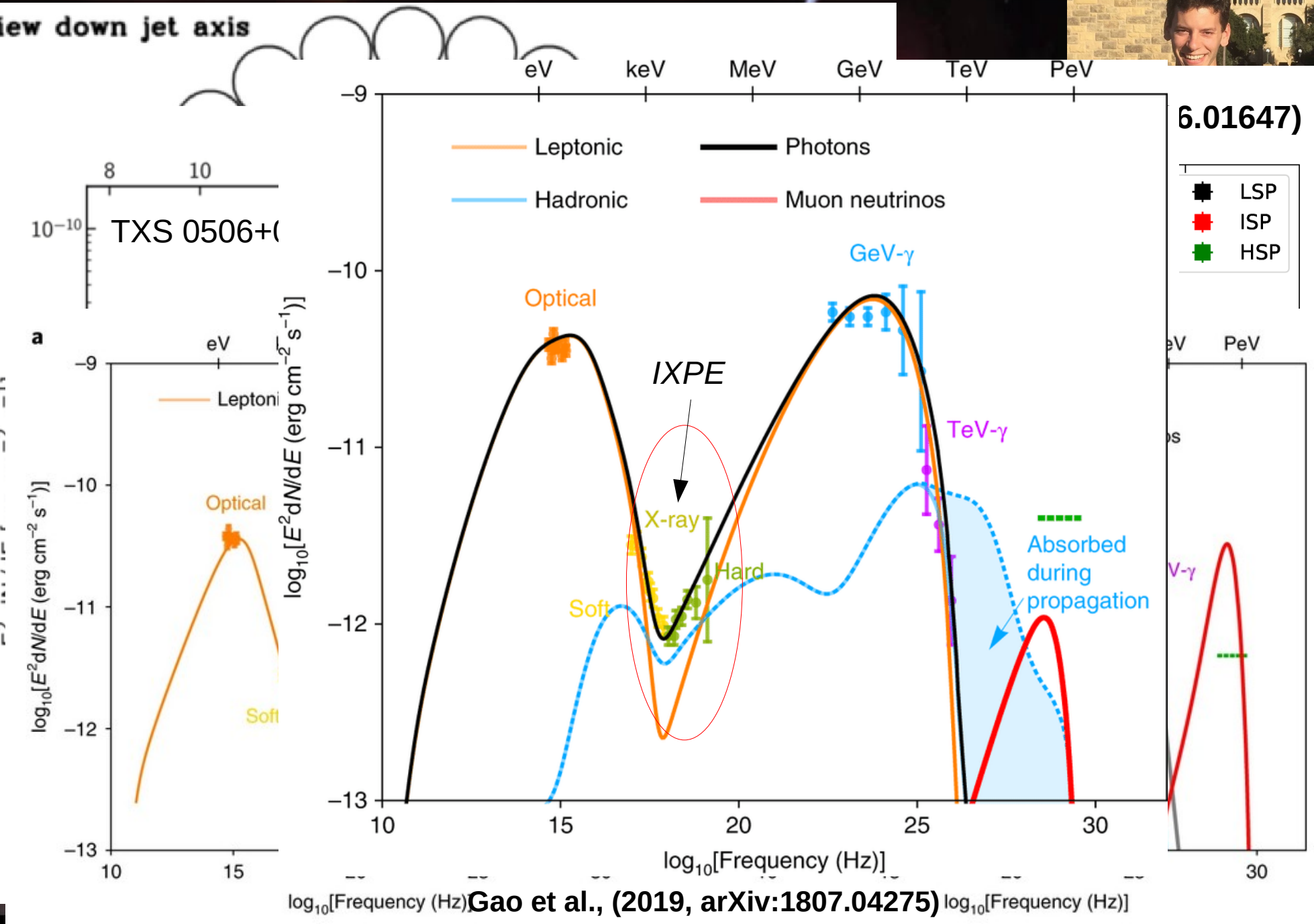

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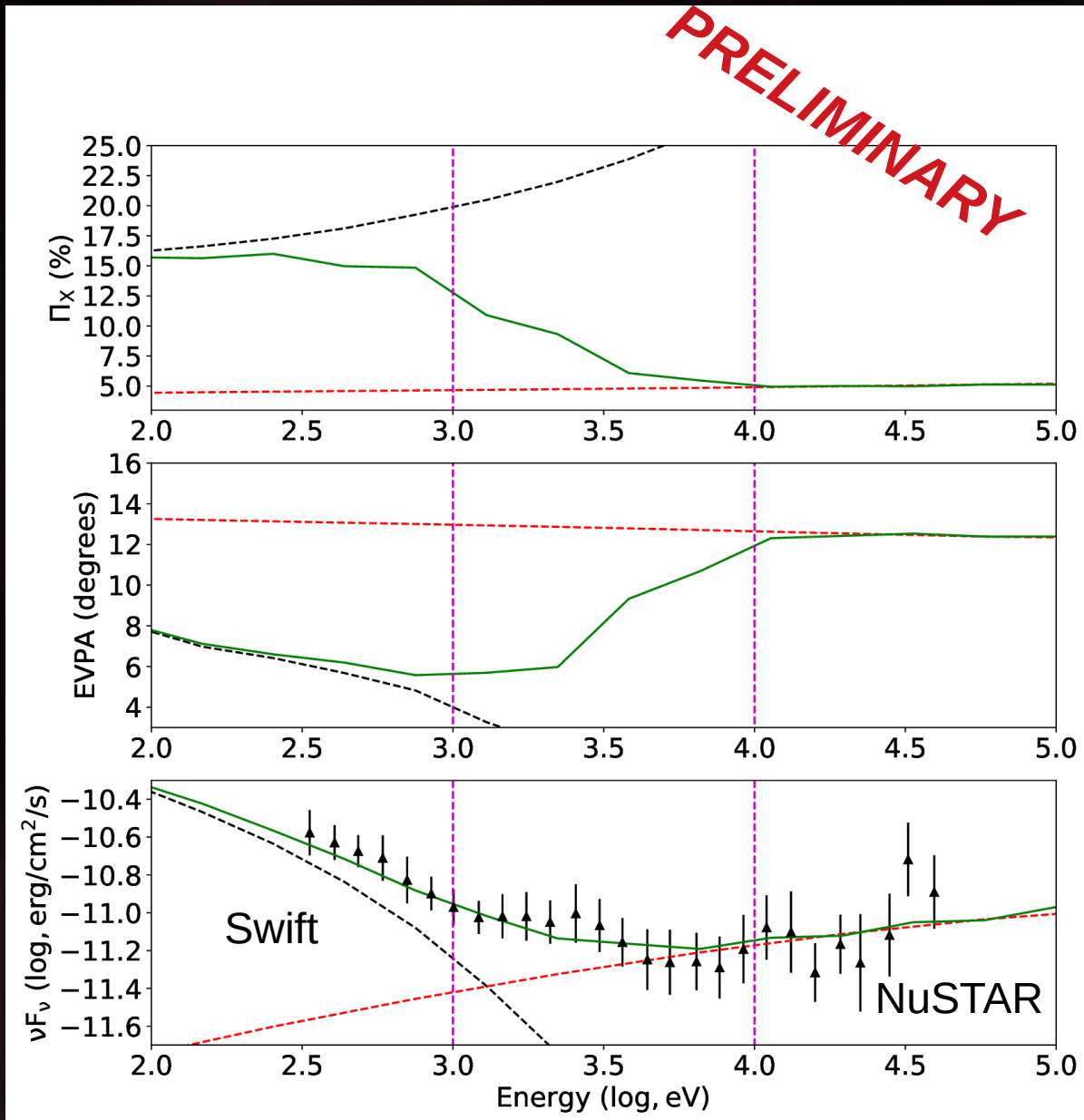
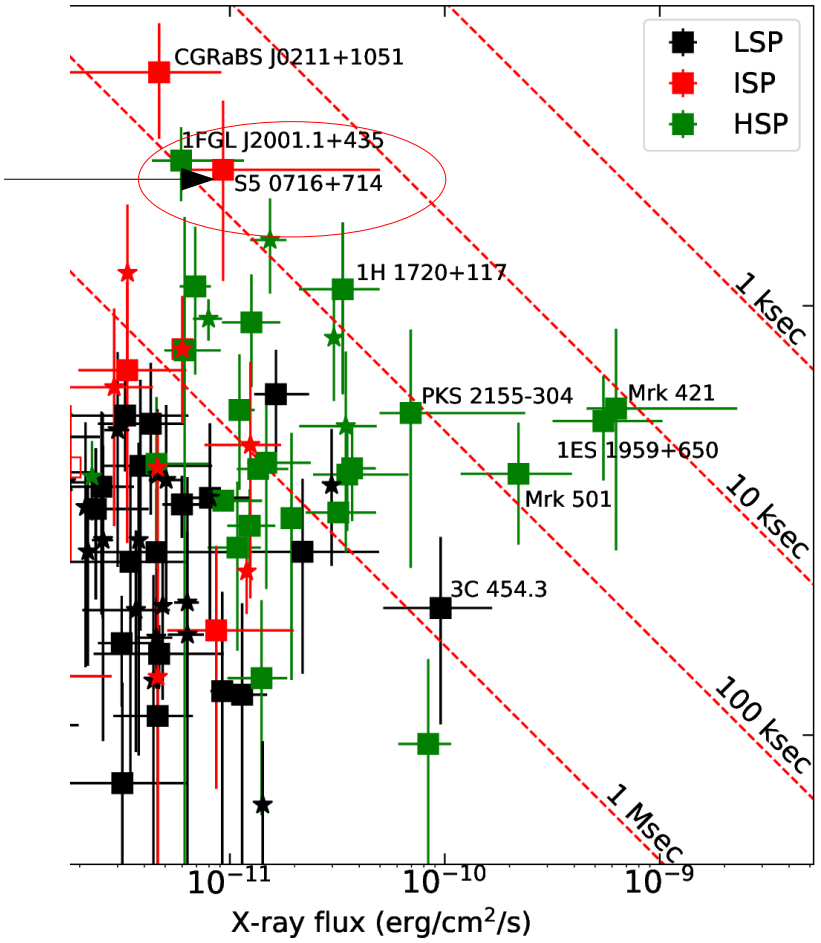
Blazars in the Synchro-Compton limit





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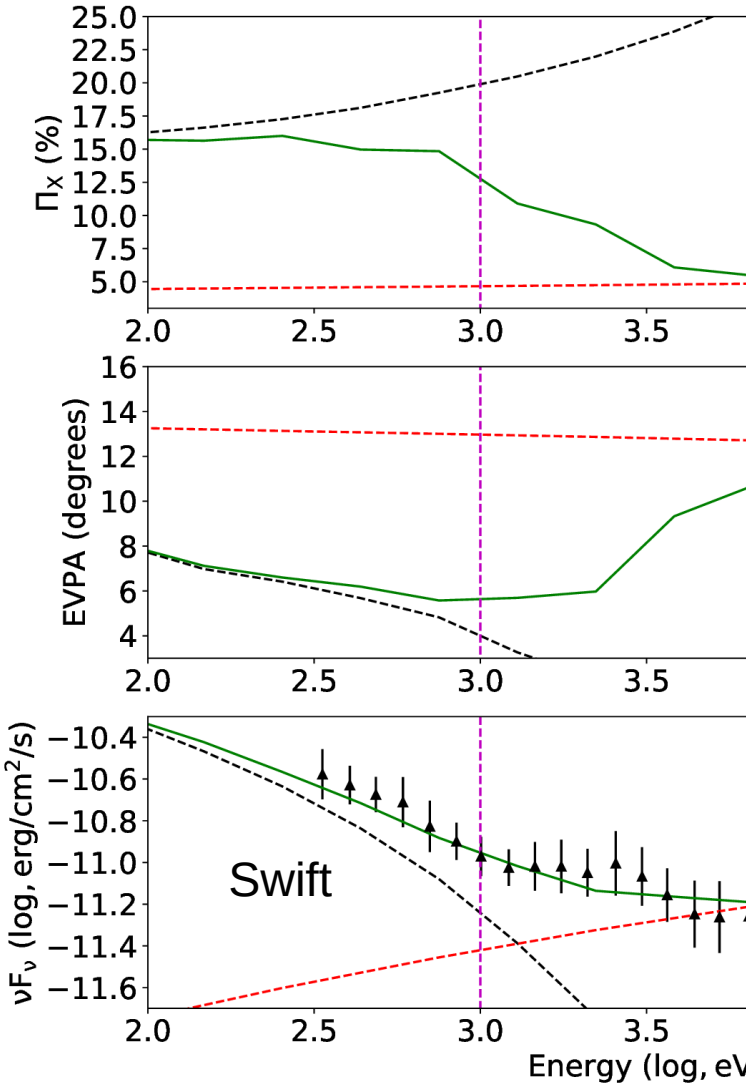
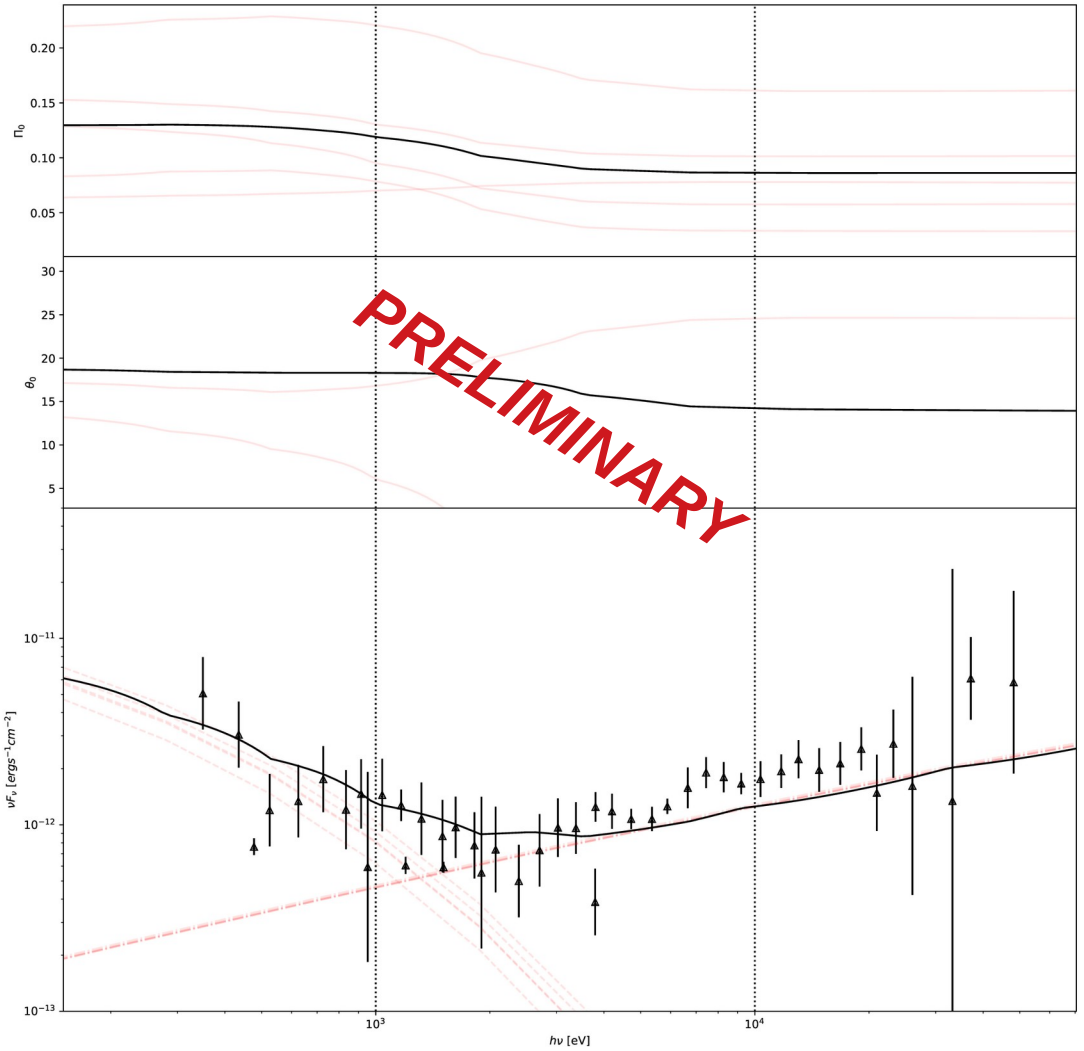


TXS 0506+056



Take home message:

Multiwalength polarization is an powerful probe of multimessenger emission from jets!

High-energy polarization will have answers to all your questions on high-energy emission process and jet composition soon!

2022 will be a very exciting time for blazars!