

The seed factor: how a combination of four observables can unveil the location of the blazar GeV emission

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What is a blazar?

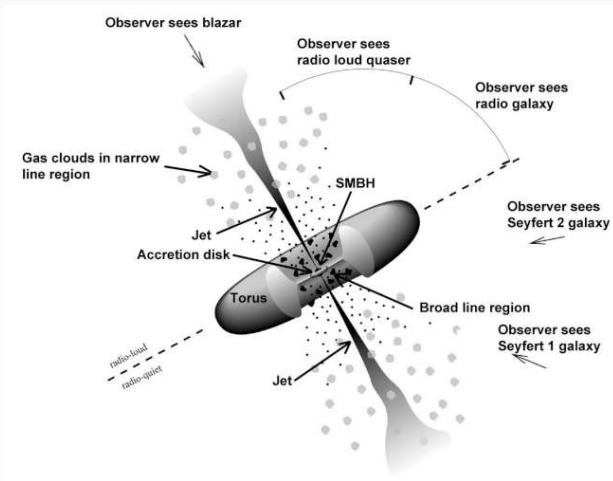
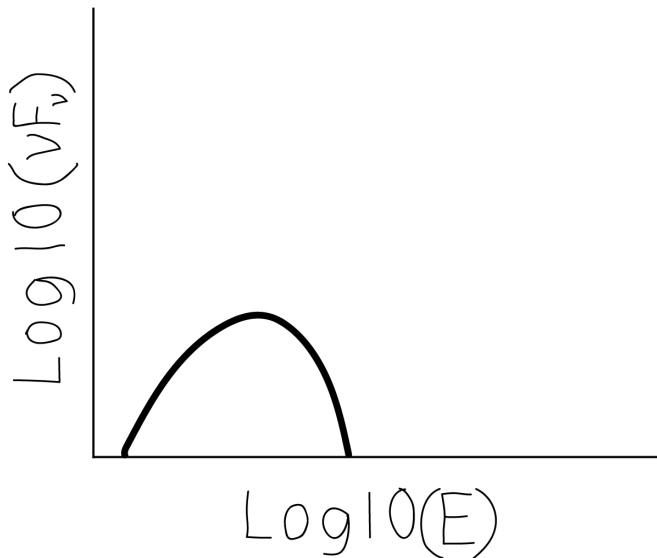
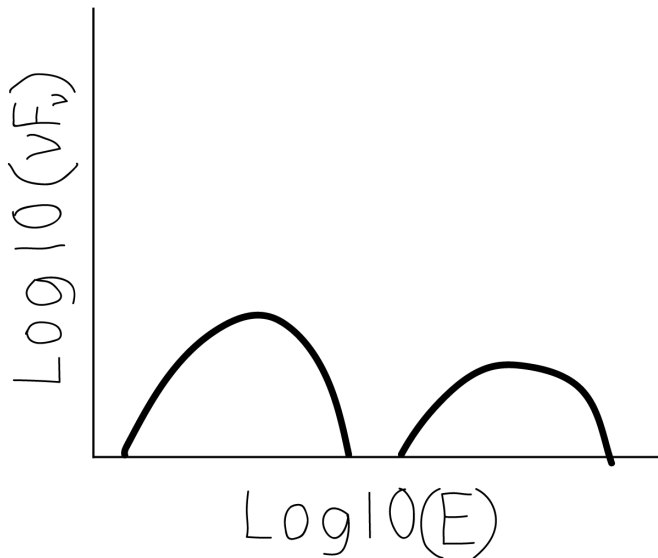
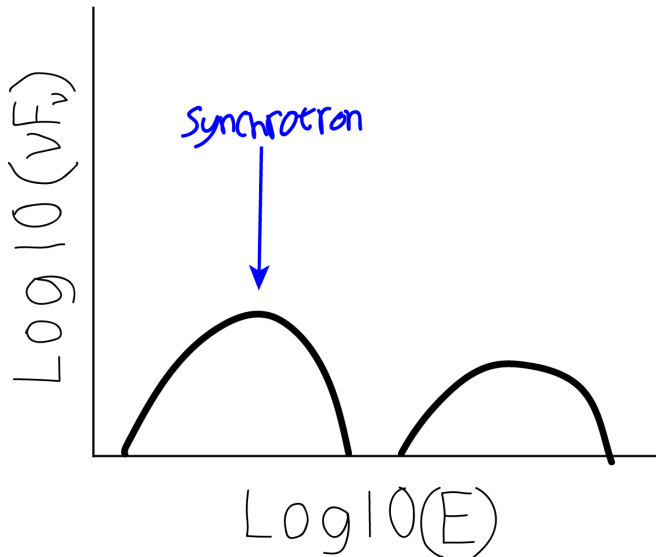


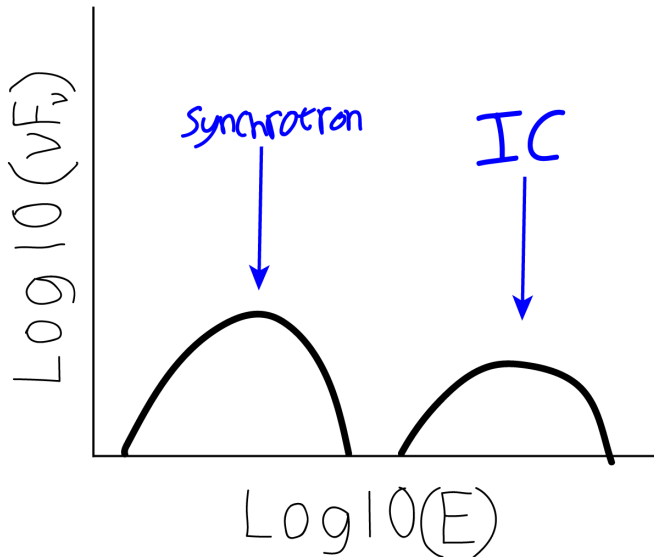
Figure 1: (Image credit: Urry et al.)







Blazar SED

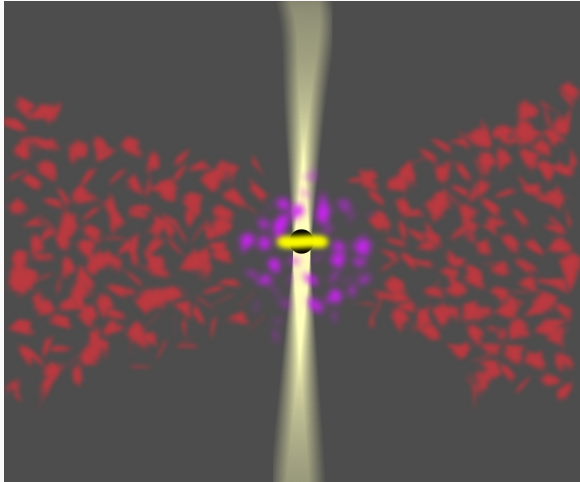


- GeV emission location open question
- Location can constrain jet formation, collimation, and particle acceleration.

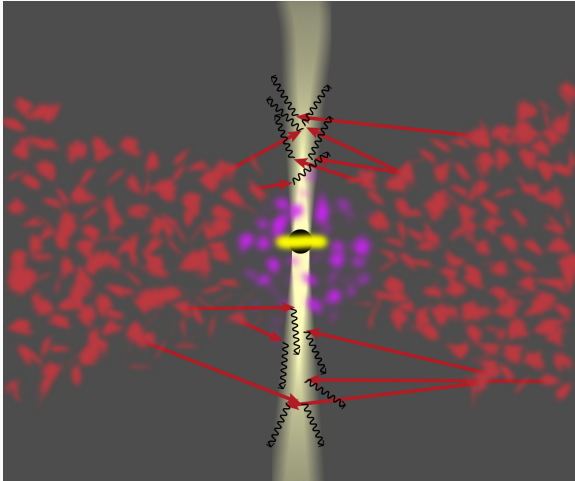
- Assume emission due to leptonic processes
- Most likely mechanism then inverse Compton (IC) scattering
- Peak energies and luminosities of components can be used to constrain emission location

$$SF = 3.2 \times 10^4 \frac{k_1^{1/2} \nu_{s,13}}{\nu_{c,22}} \text{ Gauss} \quad (1)$$

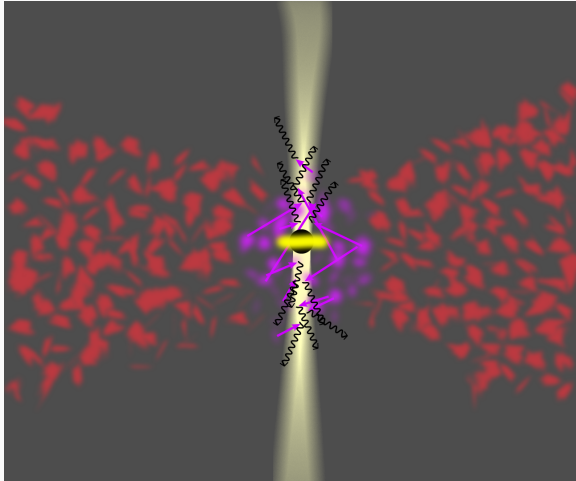
Different Emission Scenarios



Different Emission Scenarios



Different Emission Scenarios



Previous Research

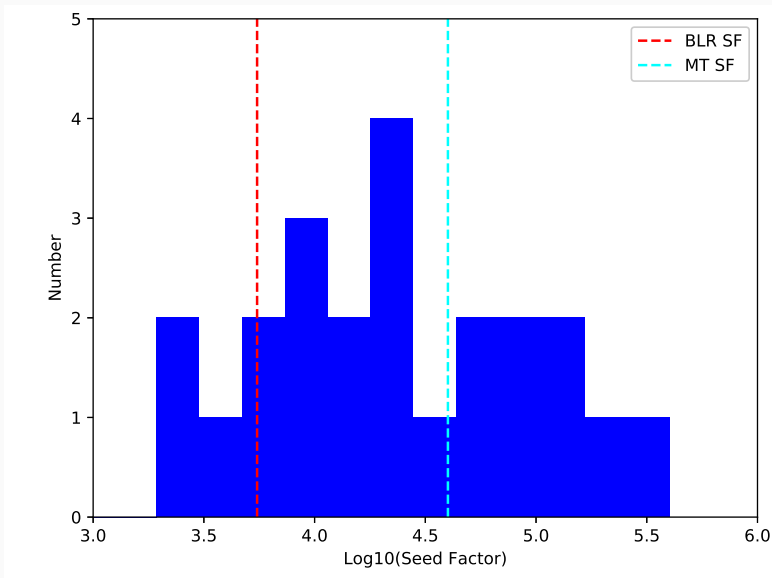


Figure 2: LBAS

Previous Research (Cont.)

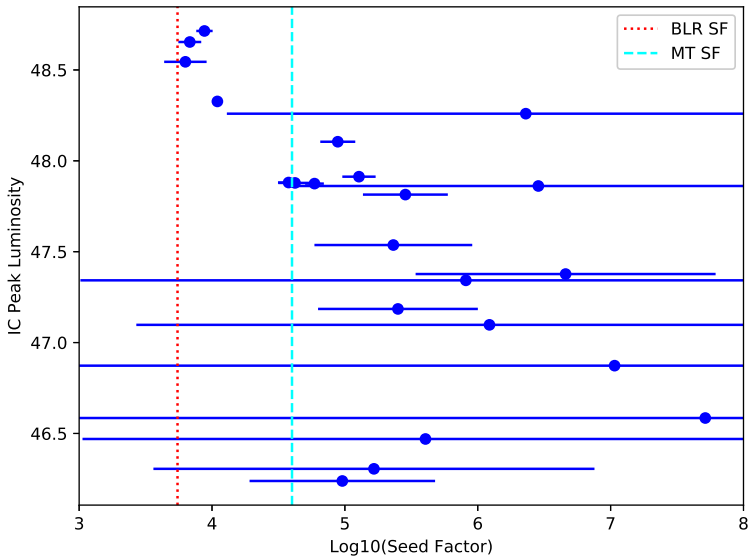


Figure 3: DSSB

Previous Research (Cont.)

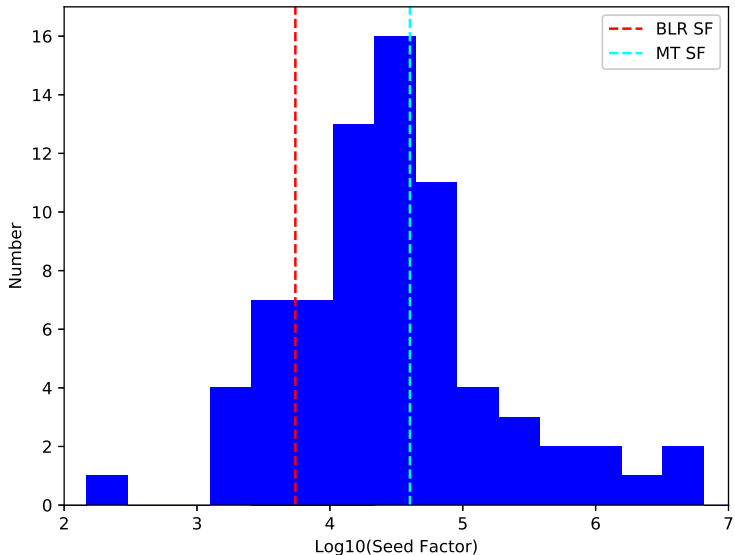


Figure 4: SED Builder

Previous Research (Cont.)

- Large errors in quantities
- Averaging over states

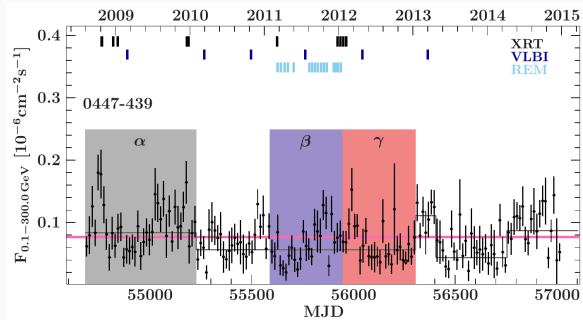


Figure 5: DSSB

Future Work

- Single-state observations
- Bright sources
- Well-observed sources (lots of states)

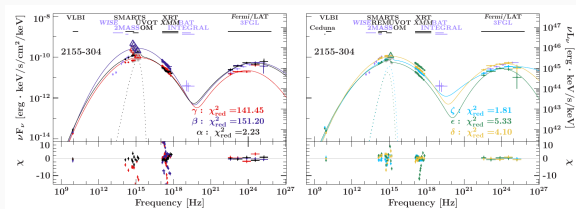


Figure 6: DSSB

Questions?

References

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- A. A. Abdo, M. Ackermann, M. Ajello, W. B. Atwood, M. Axelsson, L. Baldini, J. Ballet, G. Barbiellini, D. Bastieri, B. M. Baughman, et al., *The Astrophysical Journal* **700**, 597 (2009), ISSN 0004-637X, URL <http://stacks.iop.org/0004-637X/700/i=1/a=597>.
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