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Bundesministerium
für Bildung
und Forschung

Combined Search for UHE Neutrinos from Binary Black Hole Mergers with the Pierre Auger Observatory

Michael Schimp for the Pierre Auger Collaboration

Poster 1053


20 Jul 2021, 18:00

Discussion 27 (📍 06)



BERGISCHE
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WUPPERTAL

Idea and purpose

- Continuation of [PoS(ICRC2019)415] 
- Combine BBH mergers as E^{-2} ν standard candles
- GW information + Pierre Auger UHE ν sensitivity
→ Probe common BBH merger ν emission

- Motivation

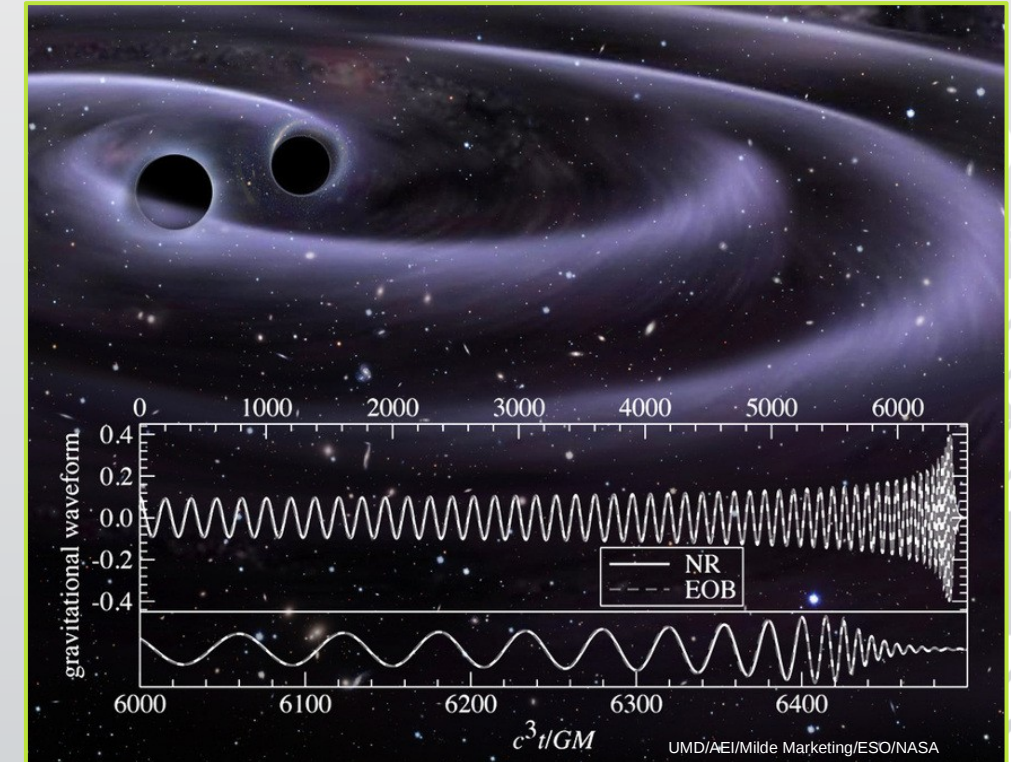
- Unique but “limited access” (single messenger, single detection principle) source type
- Theory on different BBH merger ν emission scenarios:

ApJL 823 (2016) L29

PRD 94 (2016) 023010

ApJL 821 (2016) L18

ApJ 835 (2017) 165



Source visibility

Lines:

Field of view

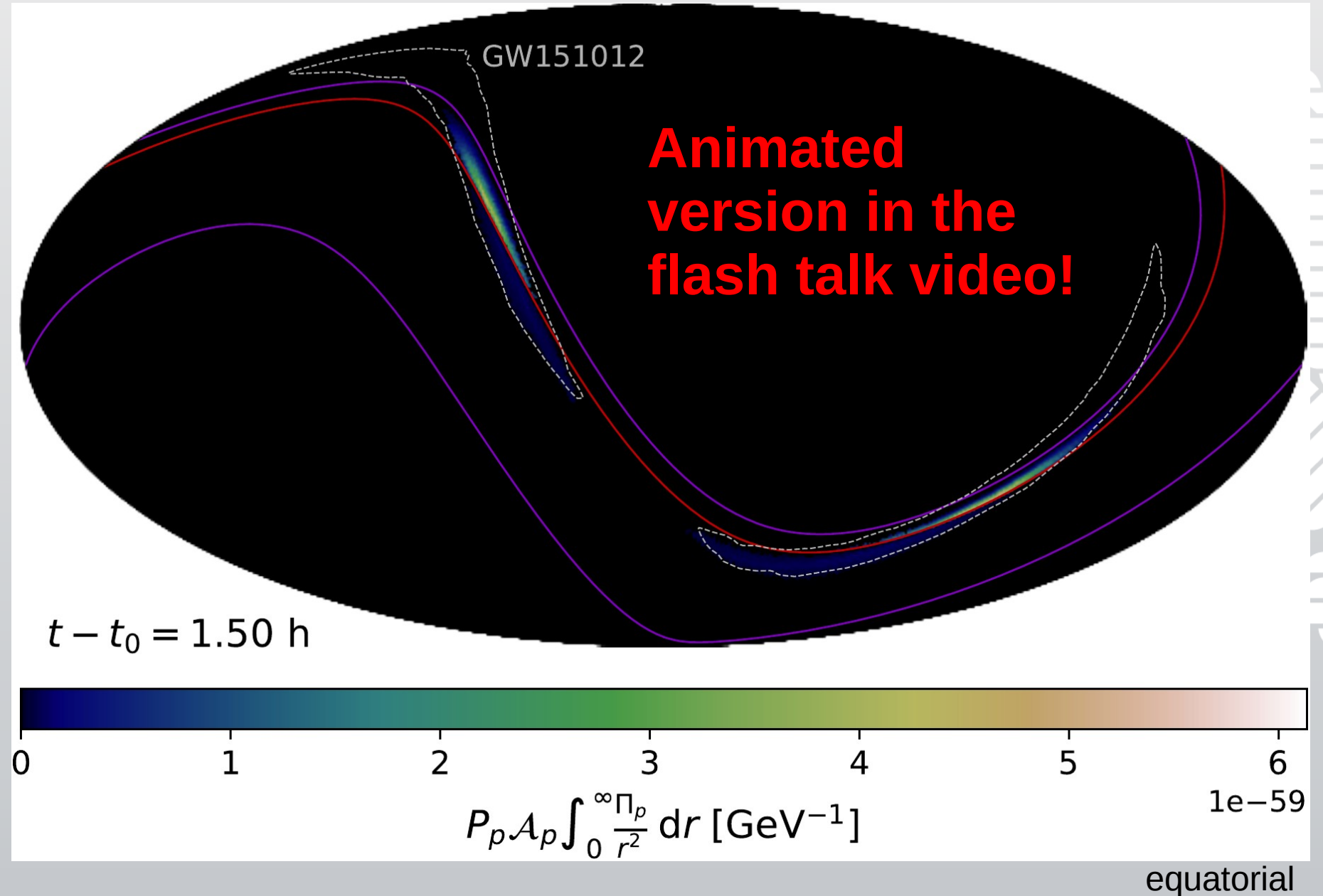
Local horizon

Color scale:

Source localization PDF

x

Auger UHE ν exposure



Results

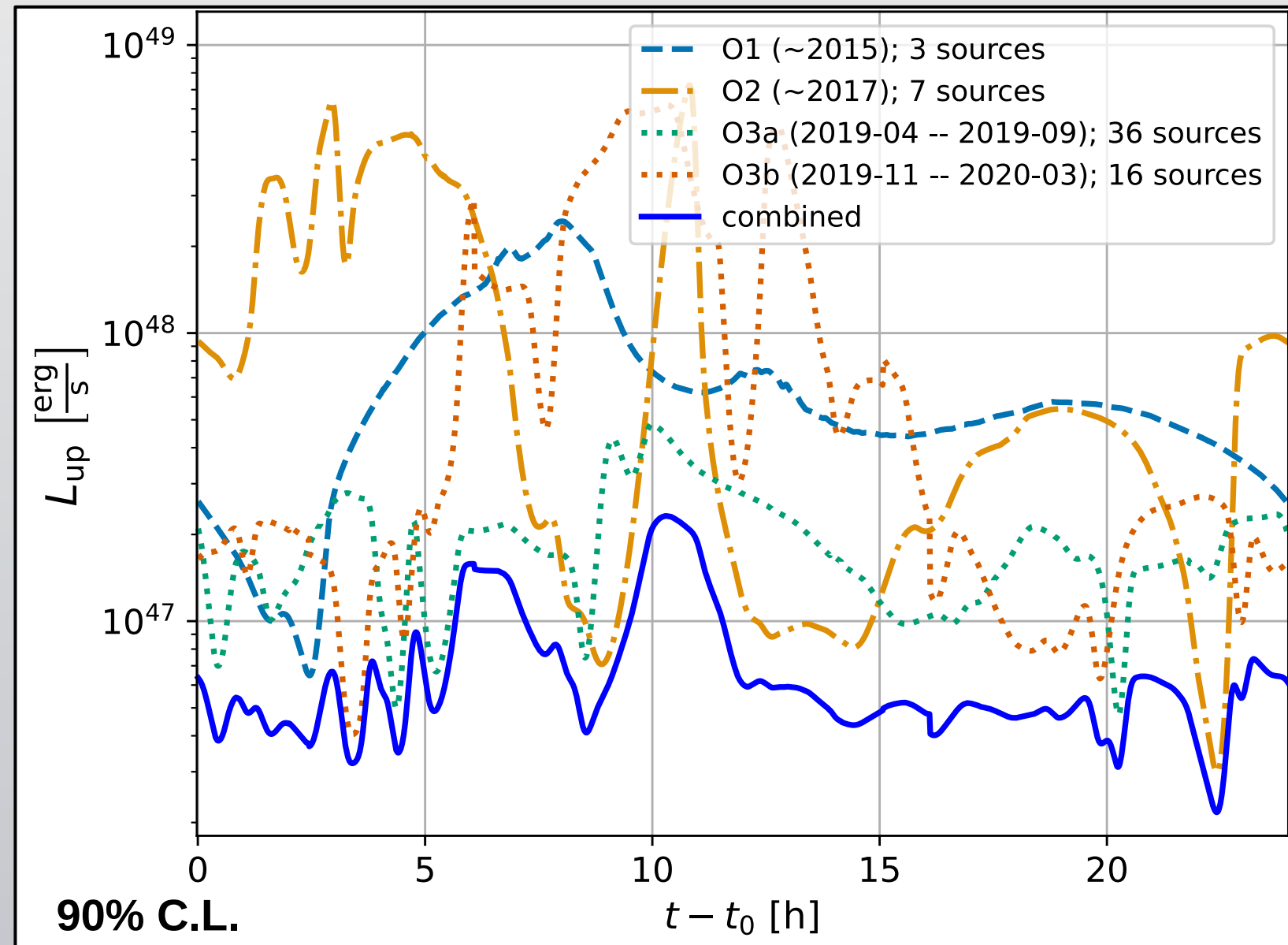
No ν candidates found in coincidence with BBH mergers

Emitted UHE neutrino energy limit:

$$E_{\text{up}} \sim 6.0 \cdot 10^{51} \text{ erg } (\sim M_{\odot} c^2 / 300)$$

Typical E_{GW} : a few $M_{\odot} c^2$

→ ν emission by BBH mergers far below the emitted GW energy



Conclusion

Further **poster** content:

- Pierre Auger Observatory ν search details
- Detection principle
- Analysis performance
- Search and analysis procedure
- Additional long-term (60 day) search results
- Further references

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[ViMP contribution \(poster, material\)](#)



[Discussion](#)



[Proceedings](#)

