

Neutrino Emission from Supermassive Binary Black Hole Mergers

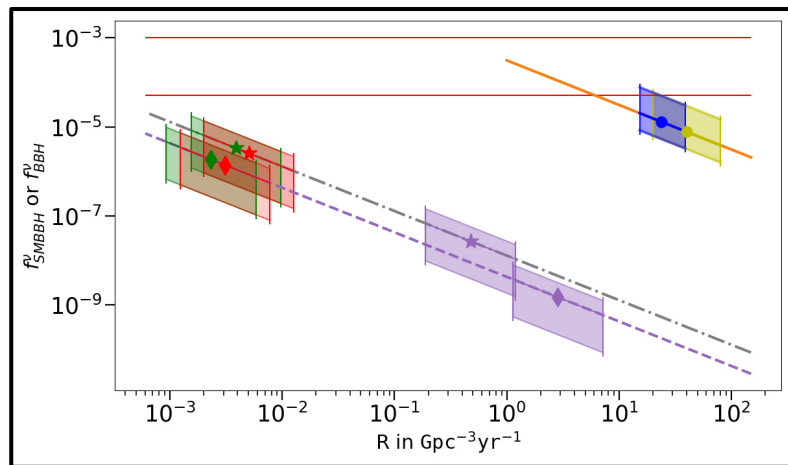
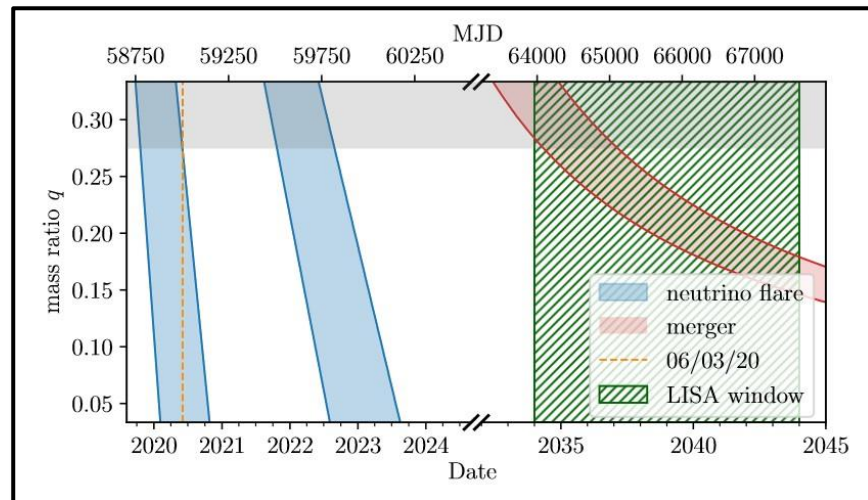
Ilja Jaroschewski, *Oliver de Bruijn, Julia Becker Tjus, Peter L. Biermann, Imre Bartos, Wolfgang Rhode*

What is it about?

- Close merger of a supermassive binary black hole leads to a spin-flip of the jet
- During this reorientation of the jet direction → jet collides with surrounding matter + produce neutrinos

Why is it relevant?

- this work explains a periodic neutrino detection from the same source
- Combines two astrophysical messengers: neutrinos and gravitational waves (GWs)



What have we done?

- Analytical model for neutrino flare and gravitational wave prediction from SMBBHs
- Investigated a possible connection between diffuse neutrino flux at IceCube and SMBBH and stellar mass BBH mergers

What is the result?

- TXS0506+056 can be a SMBBH merger close to merger next neutrino flare could have already occurred
- Diffuse neutrino flux is explainable, if the same fraction of GW energy goes into neutrinos during SMBBH and stellar mass BBH mergers