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THE DORMANT BH BINARIES: GAIA BH1 AND GAIA BH2

GAIA BH1

- $\sim 9 M_{\odot}$ BH + $\sim 1 M_{\odot}$ MS
- $P_{\text{orb}} \sim 186$ days
- $e \sim 0.45$
- $v_{\text{sys}} \sim 71$ km/s

GAIA BH2

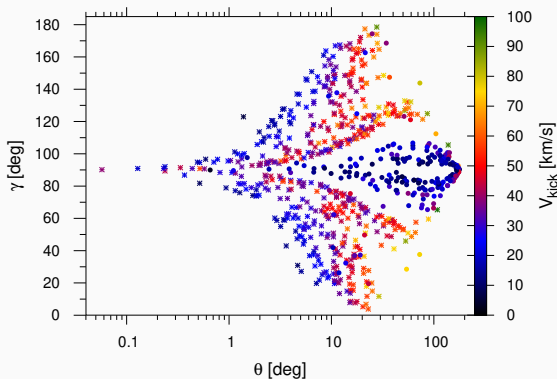
- $\sim 9 M_{\odot}$ BH + $\sim 1 M_{\odot}$ RG
- $P_{\text{orb}} \sim 1300$ days
- $e \sim 0.52$
- $v_{\text{sys}} \sim 34$ km/s

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RESULTS

- We find binaries matching Gaia BH1 and Gaia BH2 that are formed through isolated binary evolution
- The formation rates of Gaia BH-like systems through isolated binary evolution and through dynamical interactions in open clusters are comparable ($\sim 10^{-6} M_{\odot}^{-1}$) (in collaboration with S.Banerjee)
- Gaia BH1(BH2) may be the progenitors of long period Low Mass X-ray binaries population with outburst recurrence times of order of tens of years

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- Gaia BH1: 94% systems form with BH spin misaligned with binary angular momentum by no more than 40° (median $\theta \sim 10^\circ$)
- Gaia BH2: form if $v_{\text{kick}} < 42$ km/s and natal kick is directed close to the orbital plane $\pm 15^\circ$

PUBLICATIONS

- "The X-ray binaries in M83: Will any of them form gravitational wave sources for LIGO-VIRGO-KAGRA?", Kotko, I., Belczynski, K., accepted for publication in *A&A*
- "The feasible formation of Gaia BH1 and BH2 systems from isolated binaries and the consequences.", Kotko, I., Banerjee, S., Belczynski, K. (in final stage of preparation)