
Day 2 afternoon
**“Spin precession, binary morphology and spin
measurements”**

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O’Shaughnessy



Morphology and measurability - 1

- What affects spin measurement and makes it easier/harder.
- Is aligned bad
- How heavy can the BBH be before we cannot measure their spins

Morphology and measurability – 2

- When can we expect precessing searches, and do we really need them.
- Are there spin configurations that make it easier to measure deformations from GR? How do spins precess (or in general gravitate) in other theories.
- Do special spin morphologies (flip-flop, resonances) help us; can we find smoking guns?

Waveforms

- What are the prospects, can we do better/faster.
- Can we have precession **and** eccentricity.
- Higher order modes, when do we need them and how much they'll bias us if not accounted for
- What is the best parametrization to extract spin information and link it to astrophysics.
- How will NR contribute in the next few years

Timescales

- Of the things we need to improve/understand, which one is the most urgent?

Michael Kesden

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- How much of what we learn from the inspiral can guide or intuition for full IMR waveforms?

Katerina Chatziioannou

- Need to improve NR waveforms to be ready for $\text{SNR} = \mathcal{O}(100)$ events
- Do glitches prefer a particular sign of the various spin parameters?
- How to move away from isotropic spin priors

Richard O'Shaughnessy

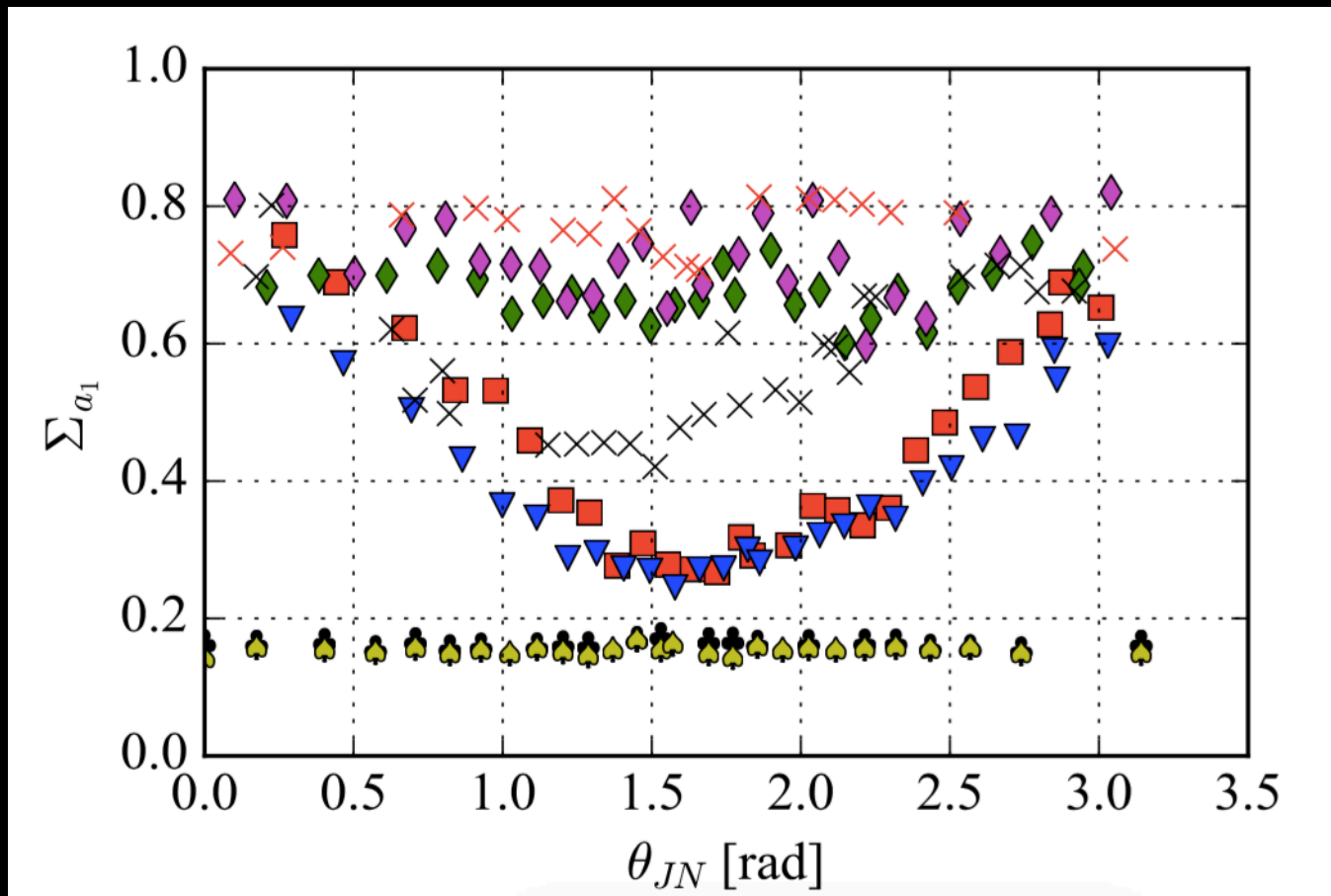
- Should the LVC release as many samples as possible so that tails are explored
- Should the LVC release results under different priors? And which ones?



Extras/plots

Uncertainties vs line of sight

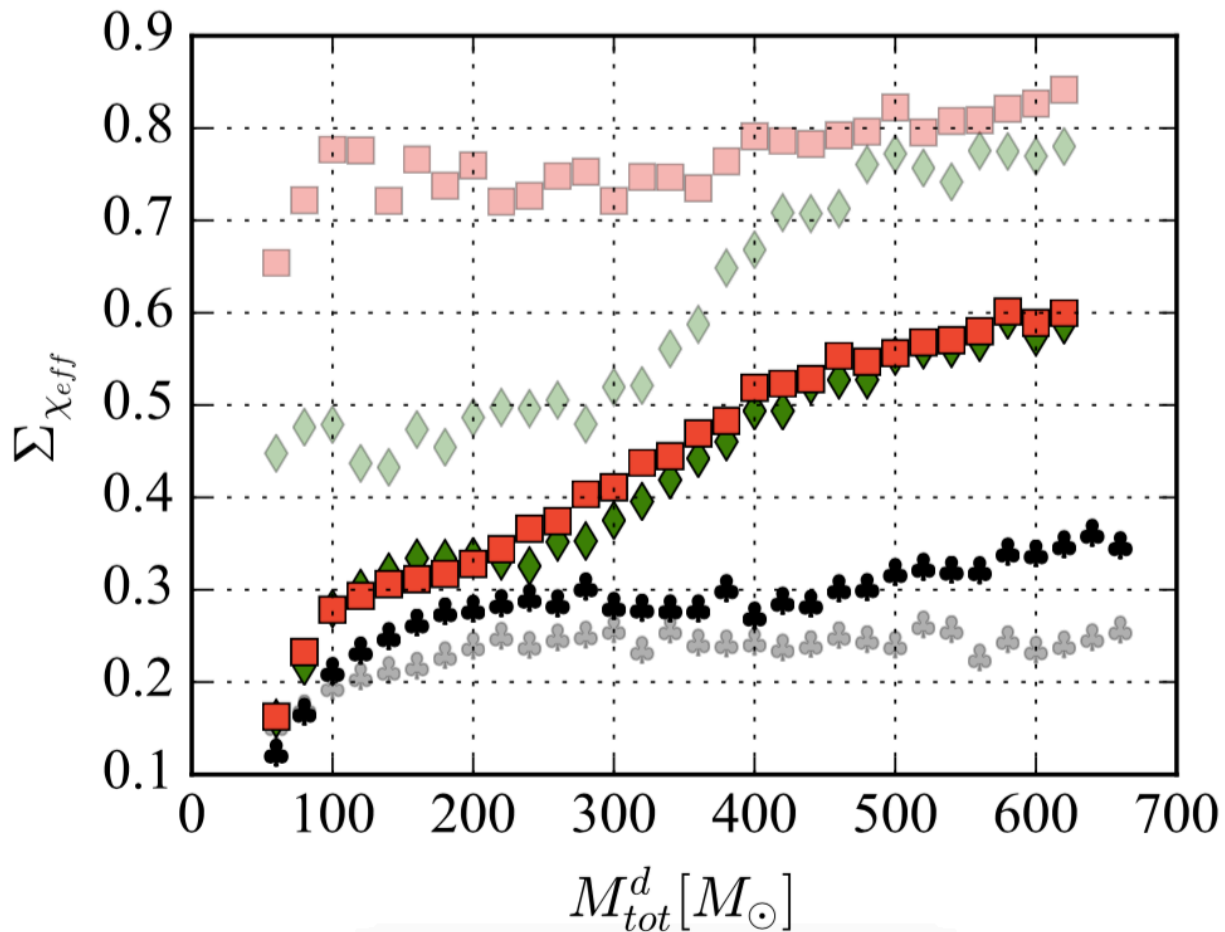
- Spin-aligned are not worse if large enough!



Vitale+, 1611.01122

	a_1, a_2	m_1, m_2	SNR	$\cos \tau_1, \cos \tau_2$	marker
q1a	0.9,0.9	35,35	17	0.5,0.5	◆
q1b	0.9,0.2	35,35	25	0.8,0.5	◆
q1d5	0.9,0.9	45,30	17	0.5,0.5	×
q1d5ss	0.4,0	45,30	17	0.5,0.5	×
q2a	0.9,0.9	70,35	17	0.5,0.5	■
q2d5	0.9,0.9	75,30	17	0.5,0.5	▼
q1ali	0.9,0.9	35,35	17	1,1	♣
q2ali	0.9,0.9	70,35	17	1,1	♠

Uncertainties vs mass



Vitale+, 1611.01122

	a_1, a_2	q	SNR	$\cos \tau_1, \cos \tau_2$	marker
q1	0.9,0.9	1	17	0.5,0.5	◆
q2	0.9,0.9	2	17	0.5,0.5	■
q1ali	0.9,0.9	1	17	1,1	♣