Probing SgrA*'s accretion flow with G1 & G2

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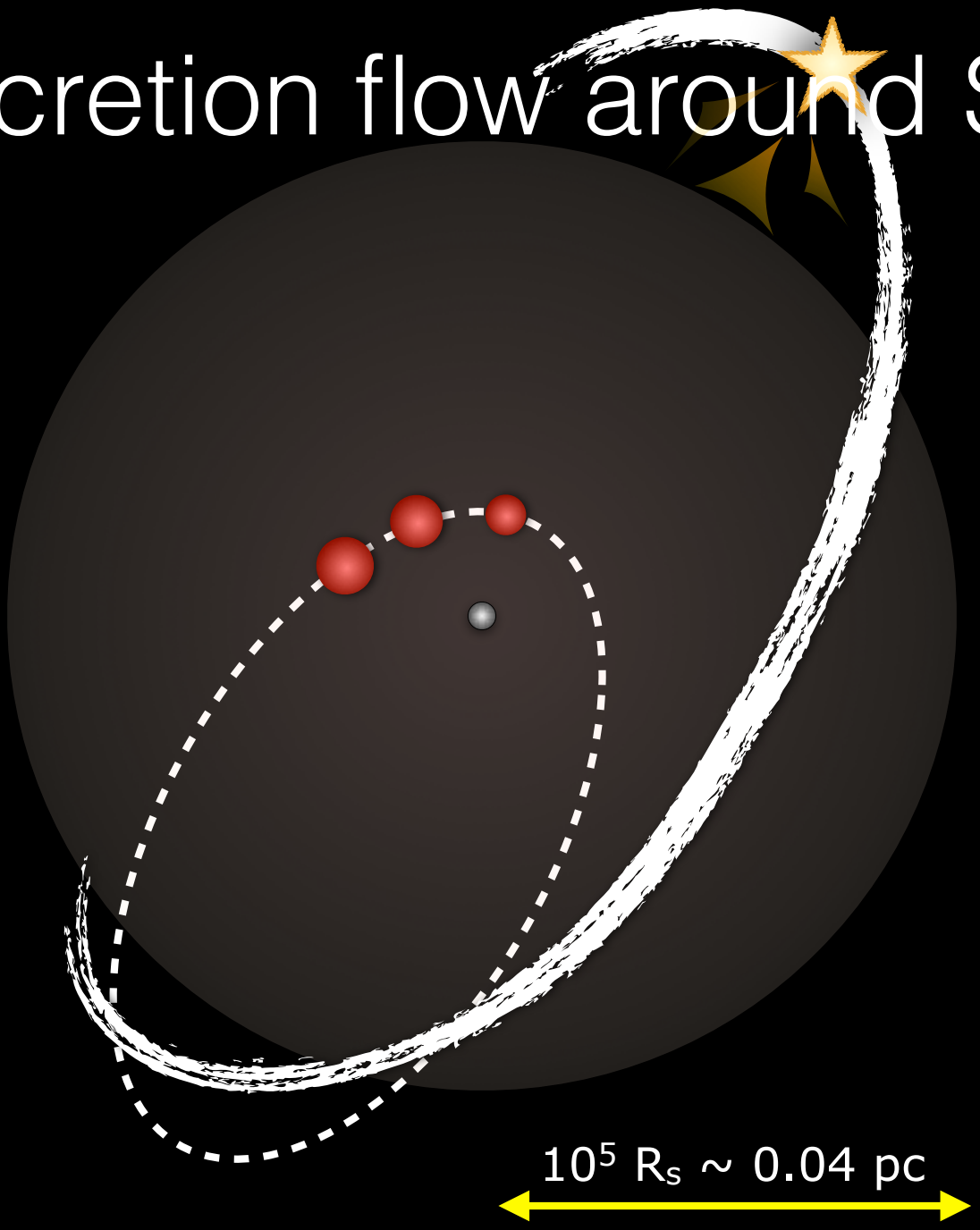
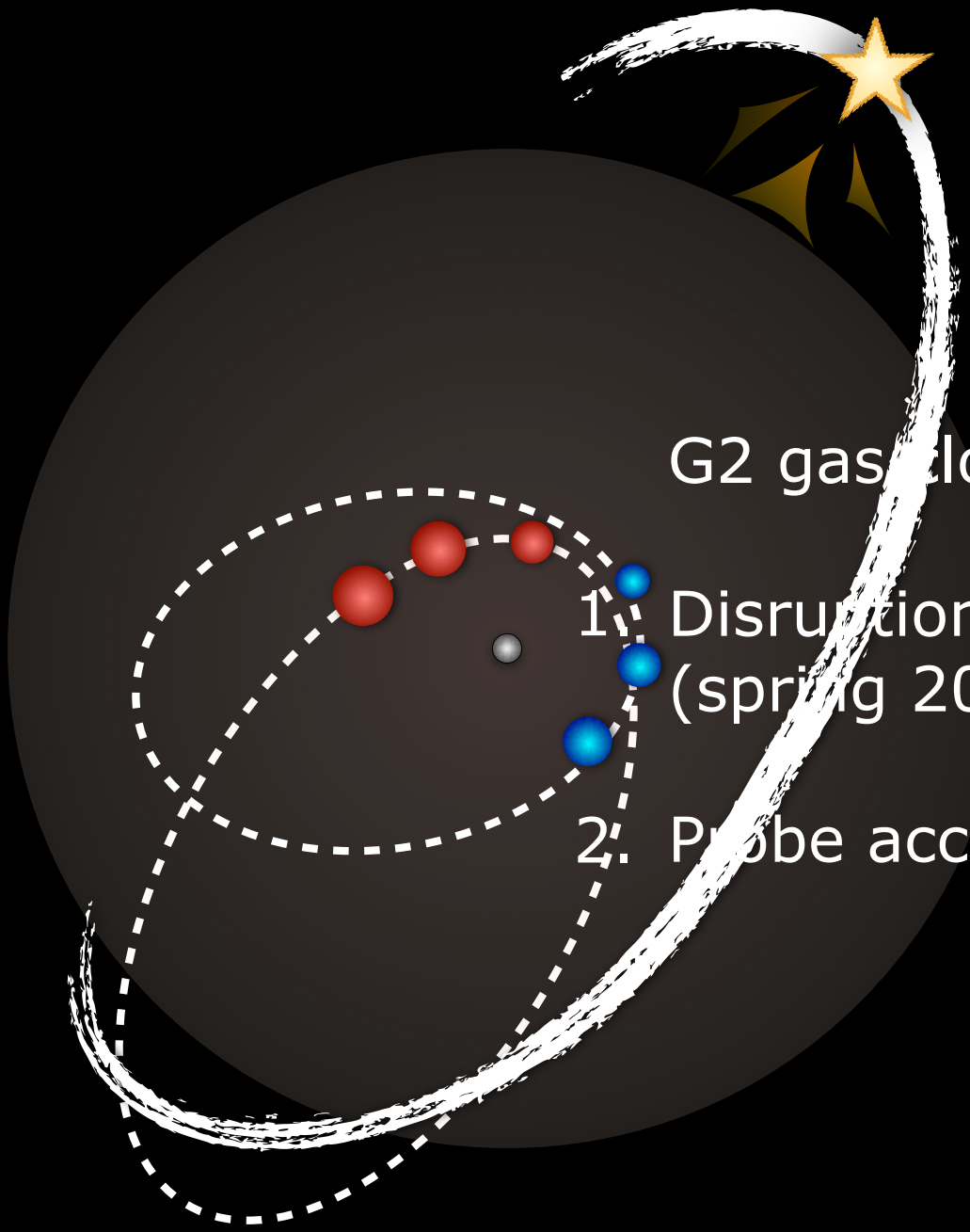
Accretion flow around SgrA*

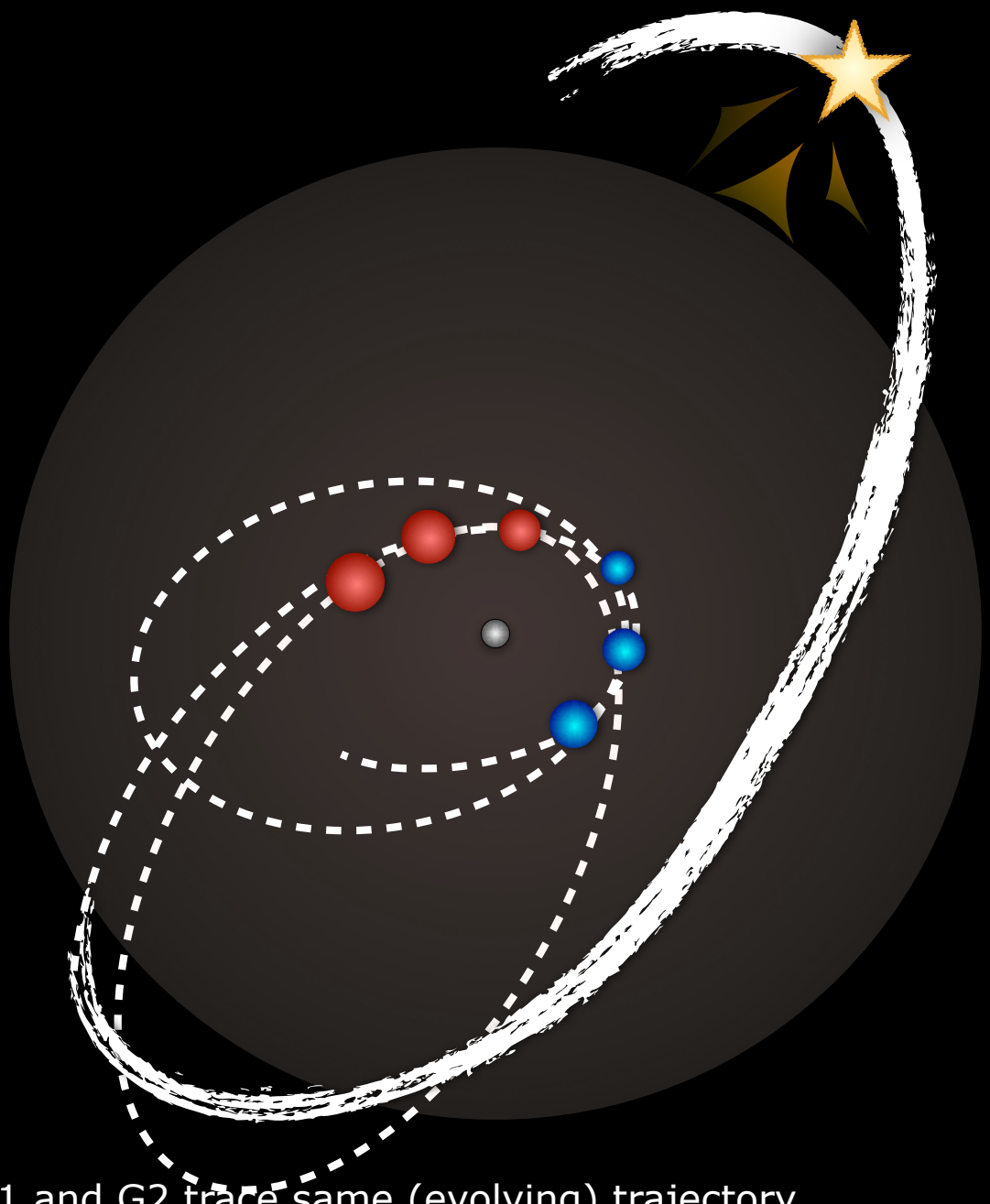




G2 gas cloud:

1. Disruption at pericenter (spring 2014)

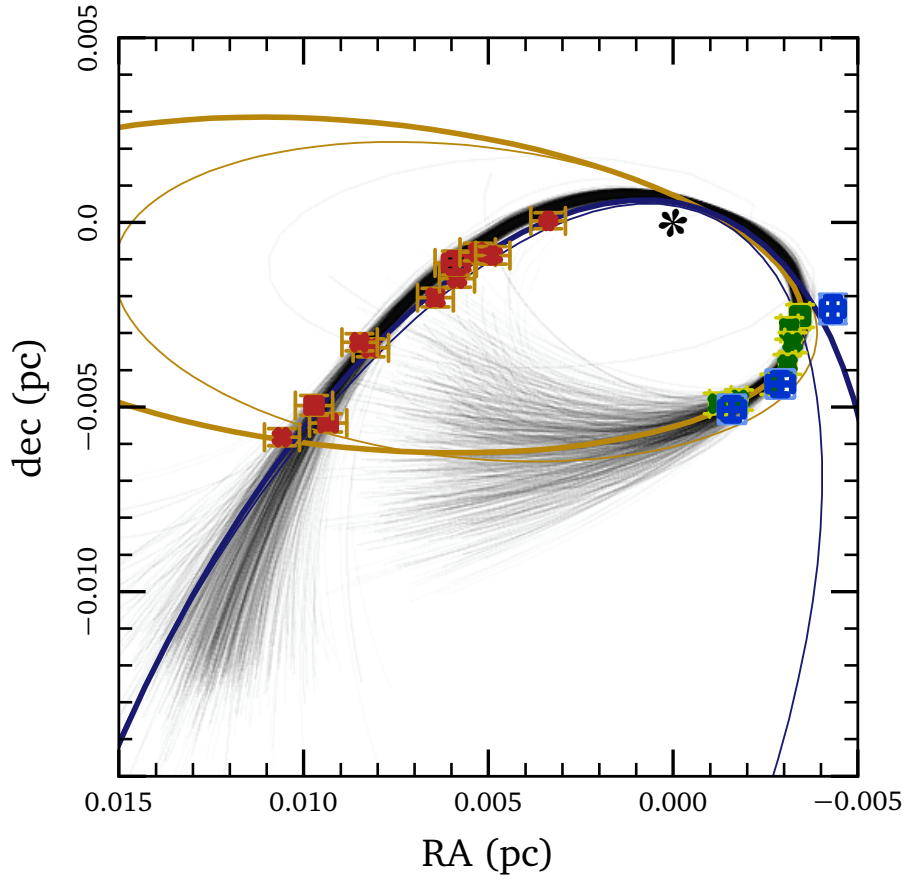
2. Probe accretion flow

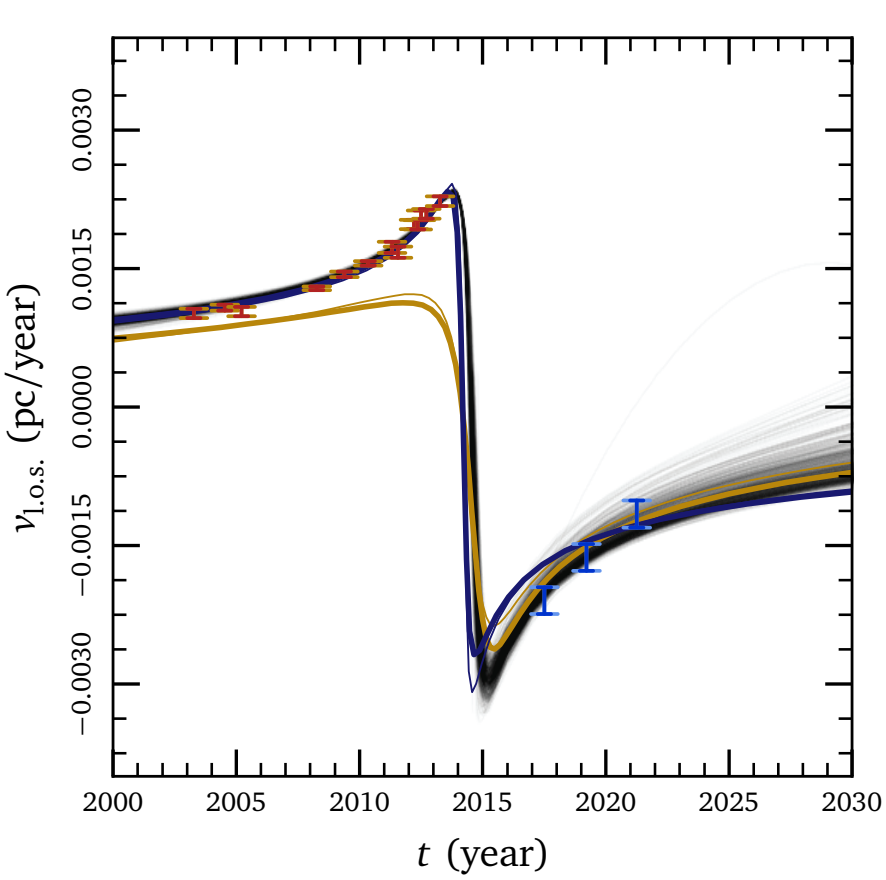


Pfuhl et al (2015): G1 and G2 trace same (evolving) trajectory

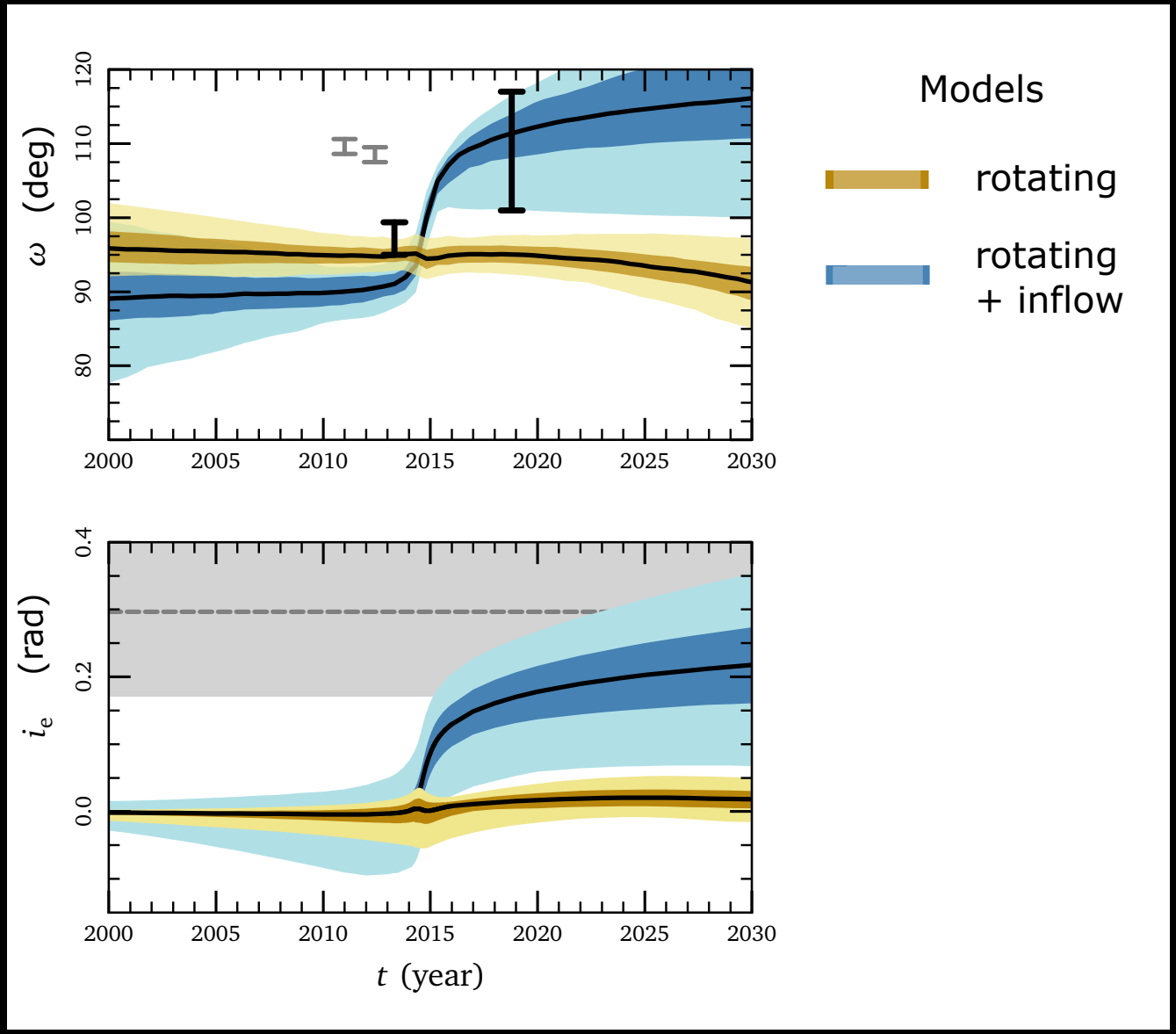
McCourt & Madigan (2016): rotating accretion flow model

Madigan, McCourt & O'Leary (2016): model with added inflow/outflow



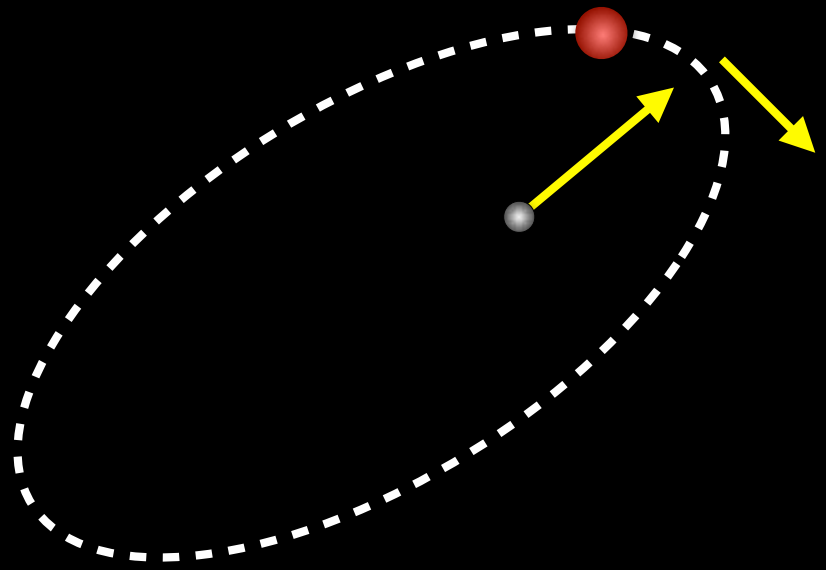


Model - Madigan, McCourt & O'Leary (2016)
Data - Gillessen et al (2013a,b), Pfuhl et al (2015)



Model - Madigan, McCourt & O'Leary (2016)
Data - Gillessen et al (2013a,b), Phifer et al (2013), Pfuhl et al (2015)

Inflow = prograde precession = delayed pericenter time



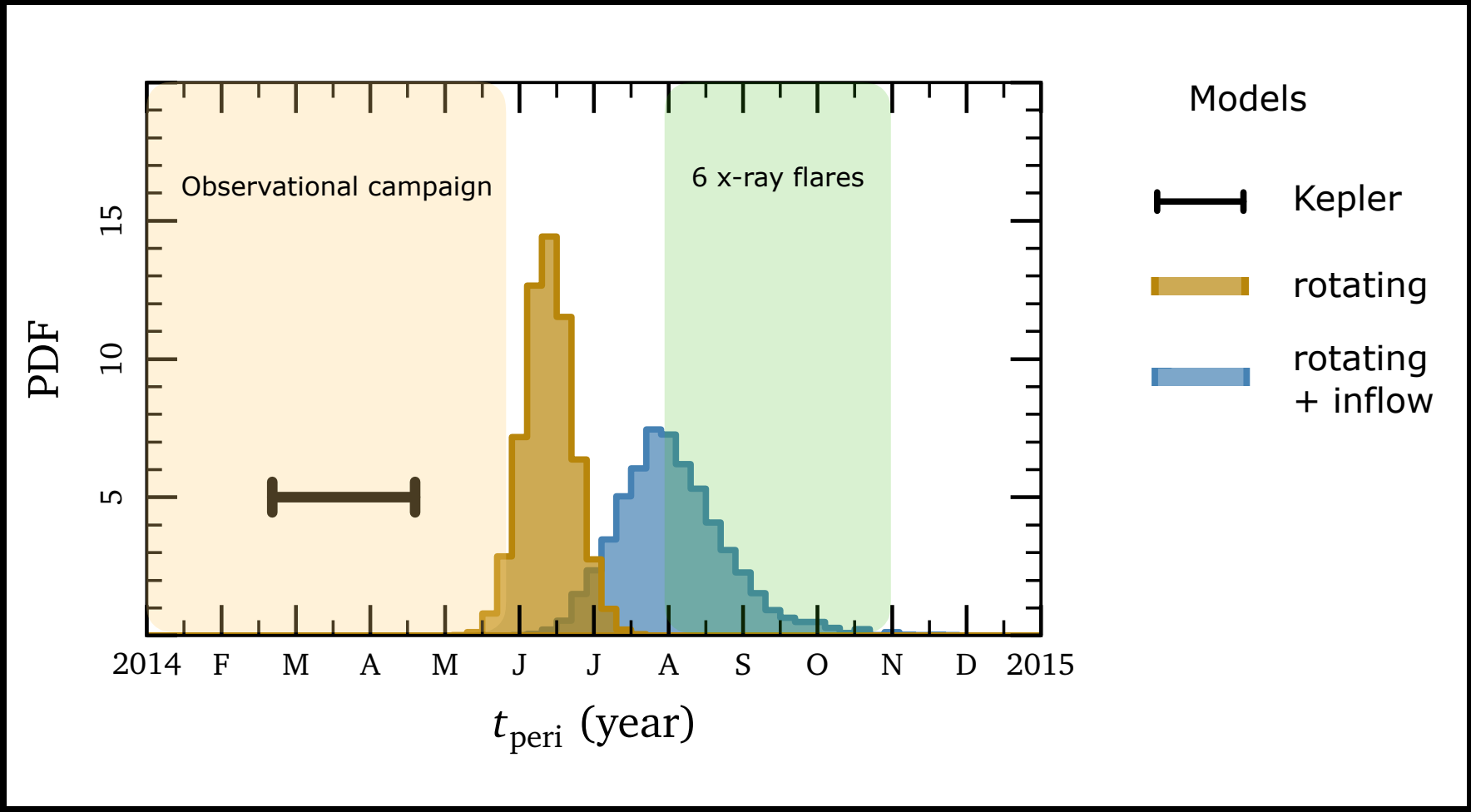
$$j = r \times v$$

$$j' = \tau = r \times f$$

$$e = \frac{v \times j}{GM} - \hat{r}$$

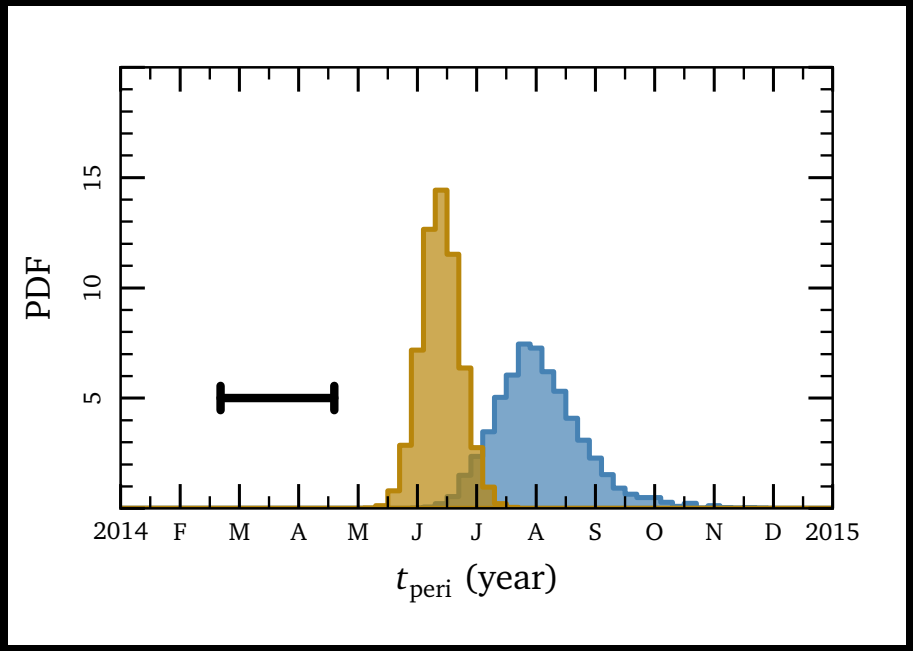
$$e' = \frac{f \times j}{GM} + \frac{v \times \tau}{GM}$$

G2 pericenter time

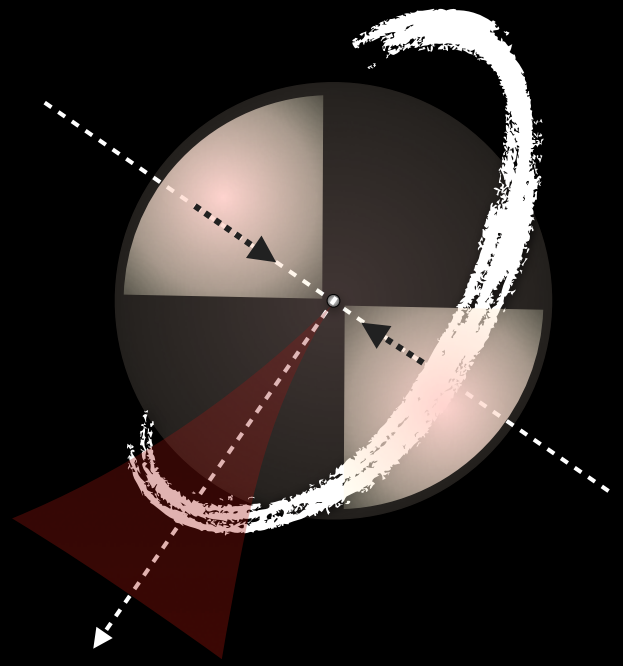


Models - McCourt & Madigan (2016), Madigan, McCourt & O'Leary (2016)
Data - Gillessen et al (2013a,b), Pfuhl et al (2015)
Flares - Ponti et al (2015), Degenaar et al (2015)

Main results



1. Delayed G2 pericenter



2. Rotation axis aligned with
   Galaxy/CND
   Inflow along G1/G2 orbit