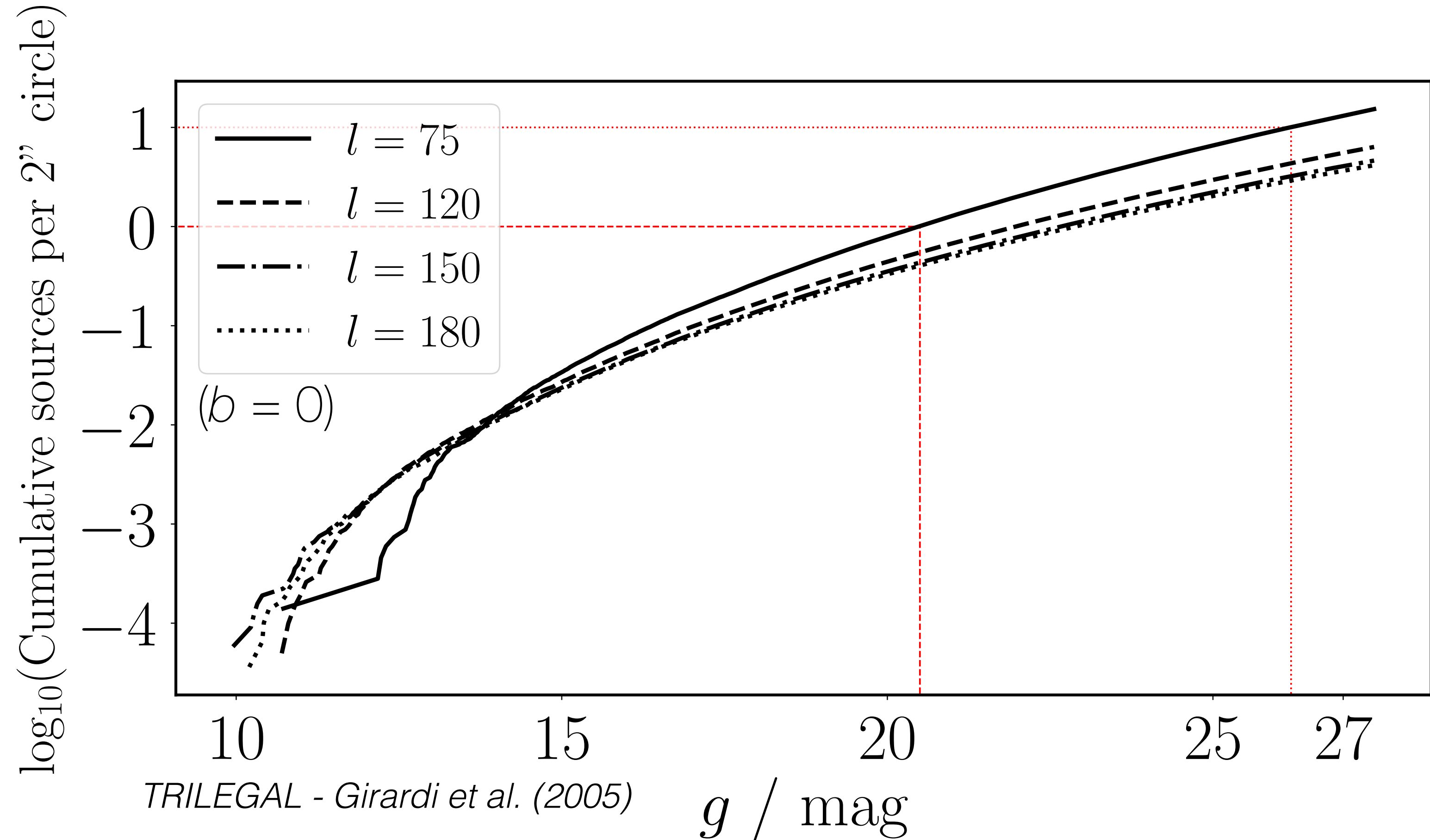
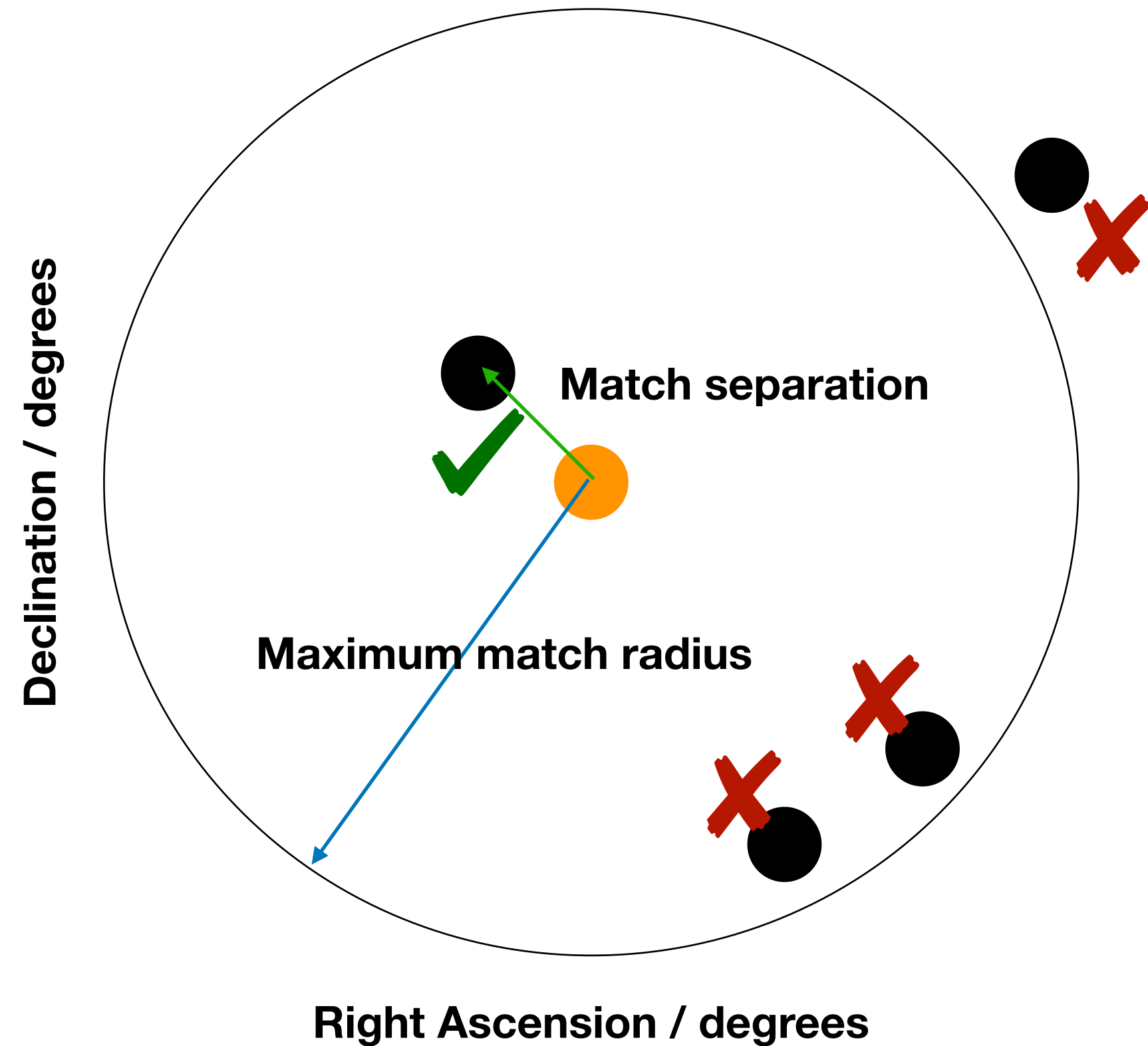


macauff:

Matching Across Catalogues using the Astrometric Uncertainty Function and Flux;
or, how to get robust source counterpart identification in the crowded LSST sky

Nearest neighbour matching

Not going to work with LSST!



macauff:

Matching Across Catalogues using the Astrometric Uncertainty Function and Flux;
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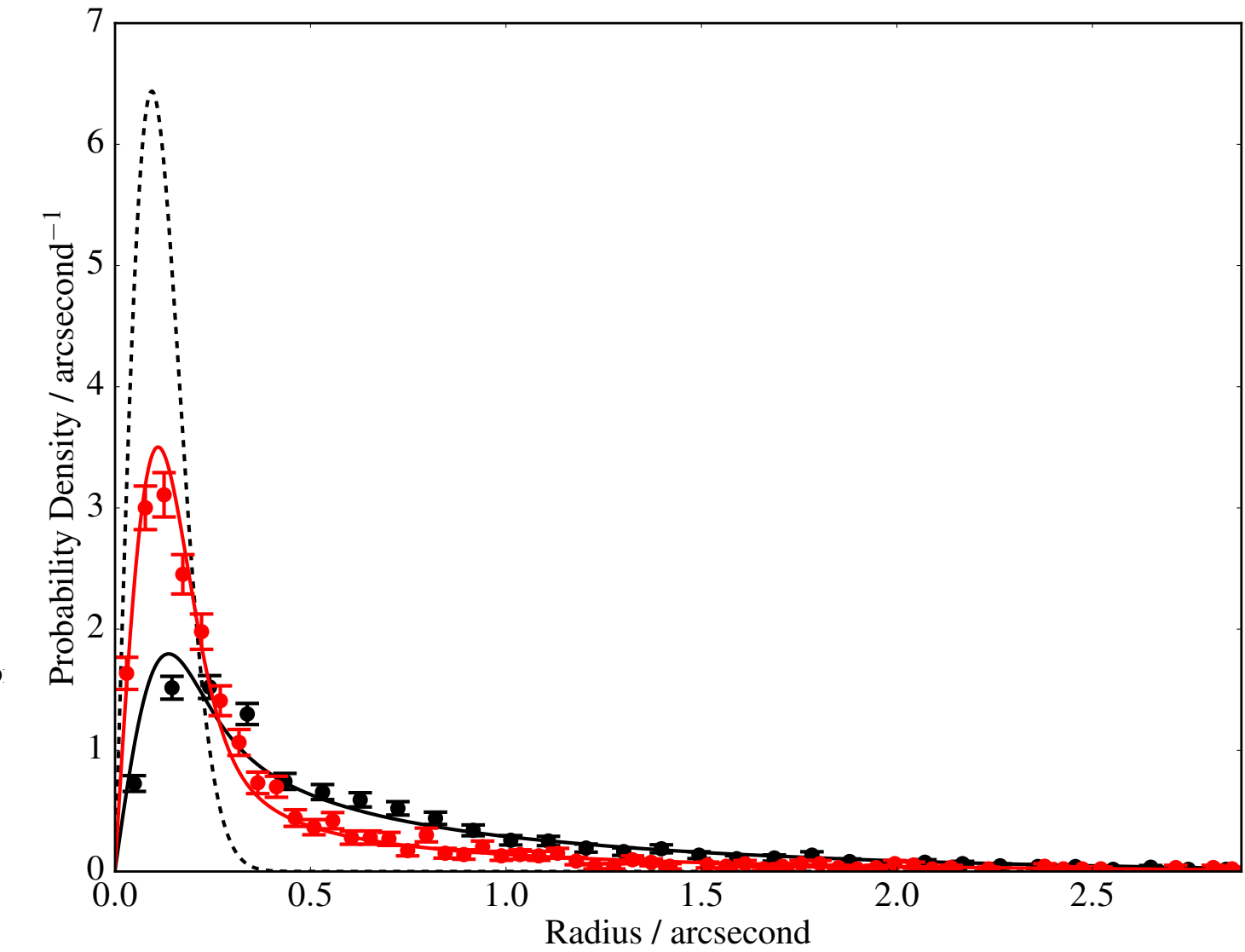
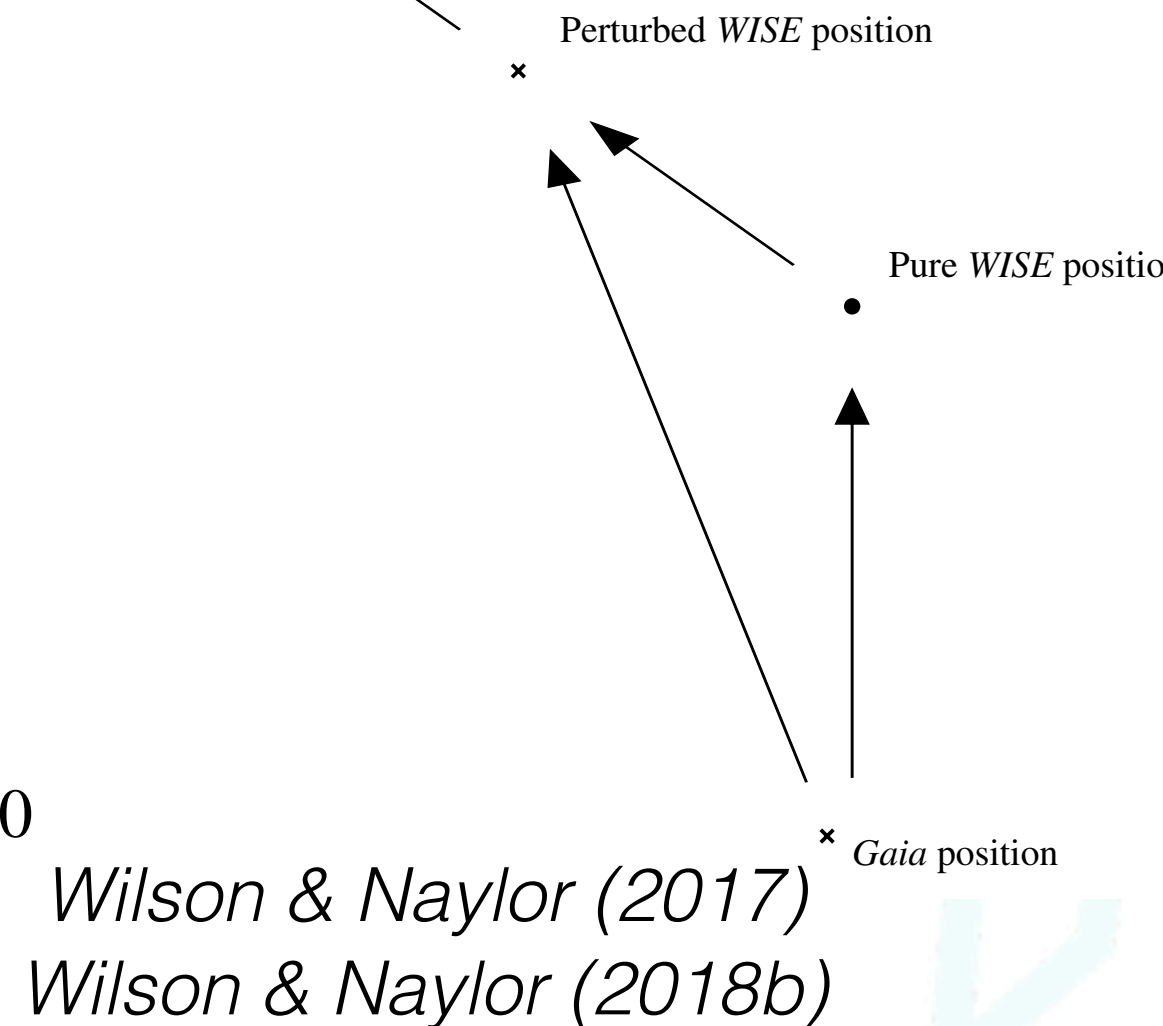
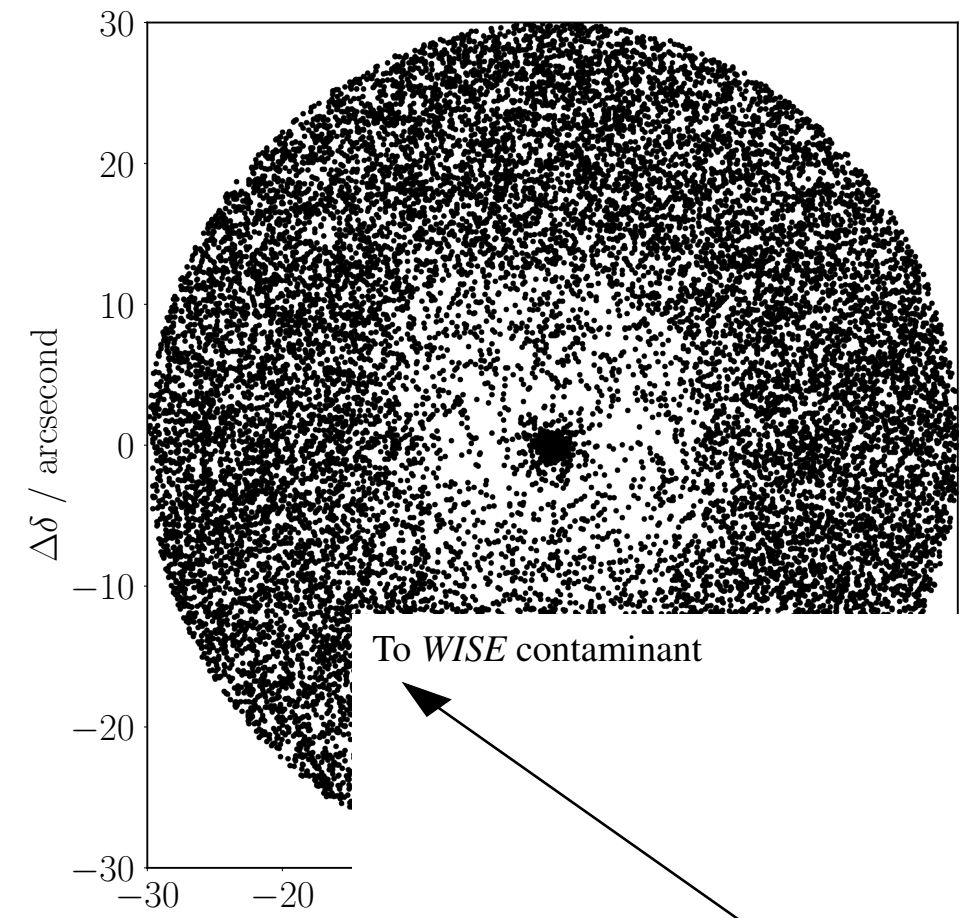
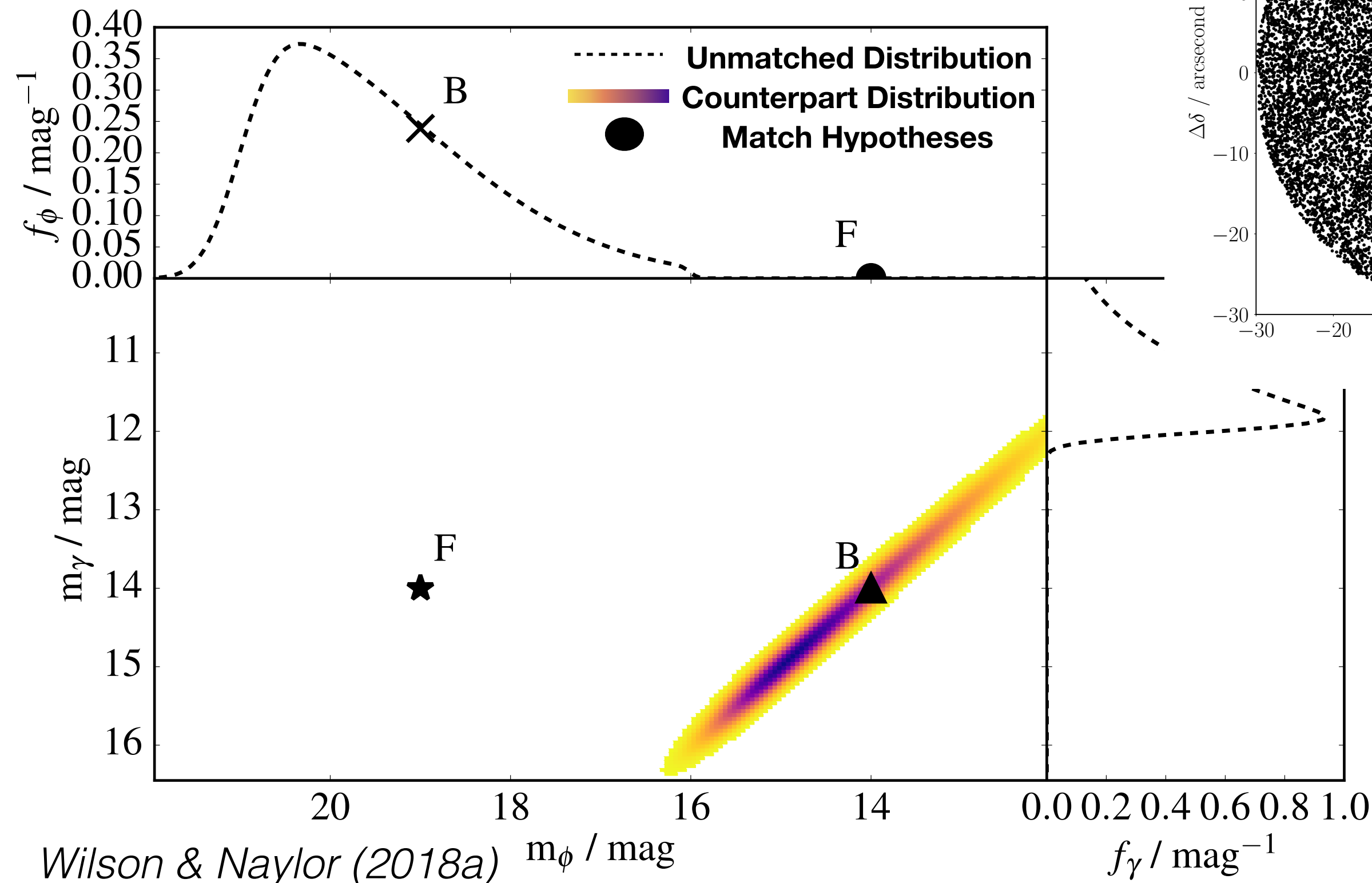
Use probabilistic matching instead!



Why should you use our Bayesian cross-match service?

1) Reject false matches, such as the ~10 extra unrelated LSST objects within 2 arcseconds

2) Only we account for the effects of crowding on the astrometry of sources



WISE - Wright et al. (2010)
 Gaia DR2 - Gaia Collaboration,
 Brown A. G. A., et al. (2018)

macauff:

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Why is this important for LSST?



3) Extension to include unknown proper motions, crucial for LSST on long timelines

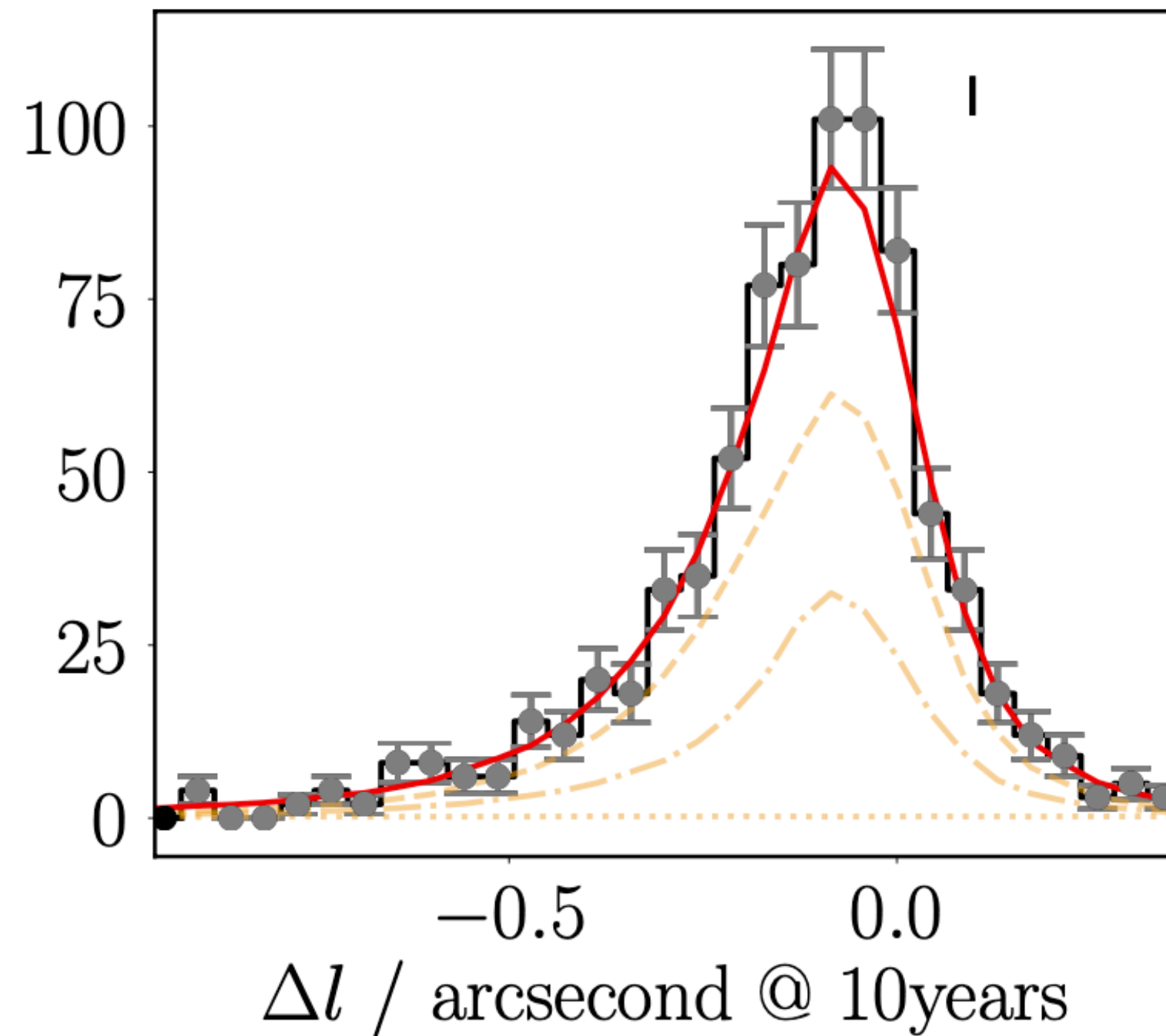
Why should you use our Bayesian cross-match service?

4) Real time alert matches – important to model astrometry of bright and faint sources right!

5) We will provide information on how much contamination sources suffer

6) Many LSST-to-your-catalogue matches planned – let me know your favourites!

- Blended star contamination causes positional shifts
- *WISE* objects are up to 30% flux contaminated, with LSST suffering similar blending in the future
- Disentangle this information with proper treatment of the cross-match algorithm
- Reject false matches by considering the relative photometry of the potential counterparts
- Open source code development ongoing at <https://github.com/Onoddil/macauff>



Wilson & Naylor, 2017, MNRAS, 468, 2517

Wilson & Naylor, 2018a, MNRAS, 473, 5570

Wilson & Naylor, 2018b, MNRAS, 481, 2148

Wilson & Naylor (in prep.)

Gaia eDR3 - Gaia Collaboration, Brown A. G. A., et al. (2021)

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github.io 