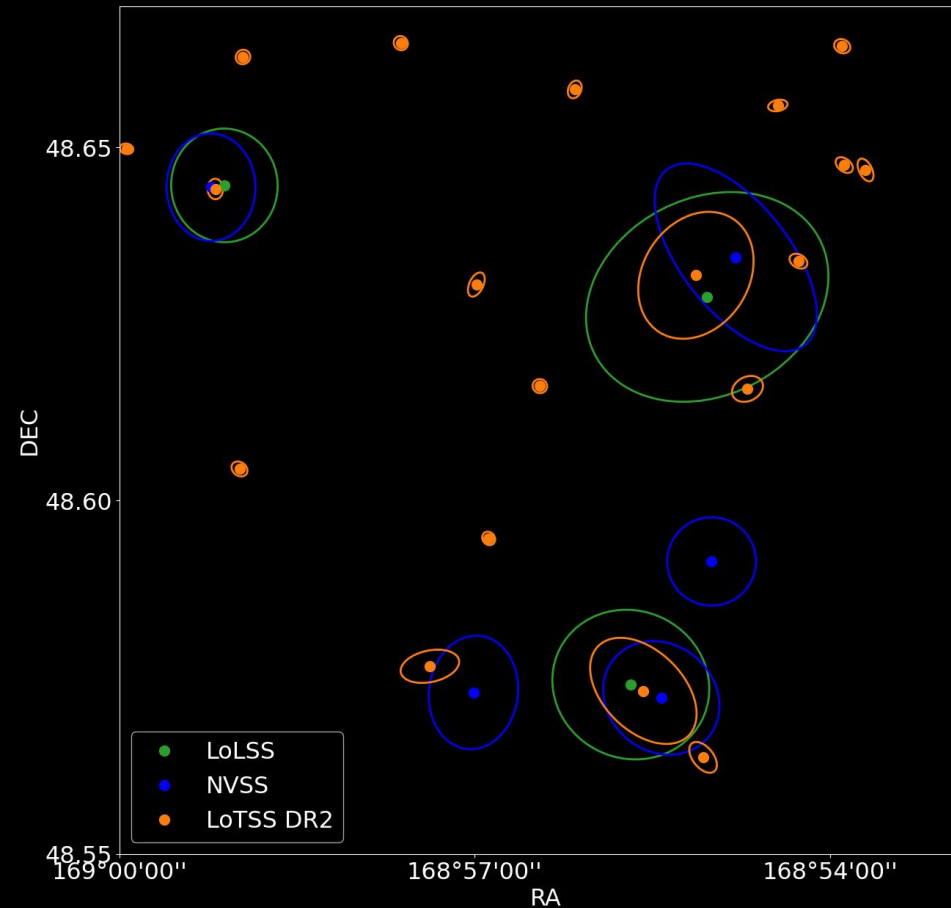


# Cross-matching LoLSS+LoTSS+NVSS with morphological considerations

Lukas Böhme  
Bielefeld University



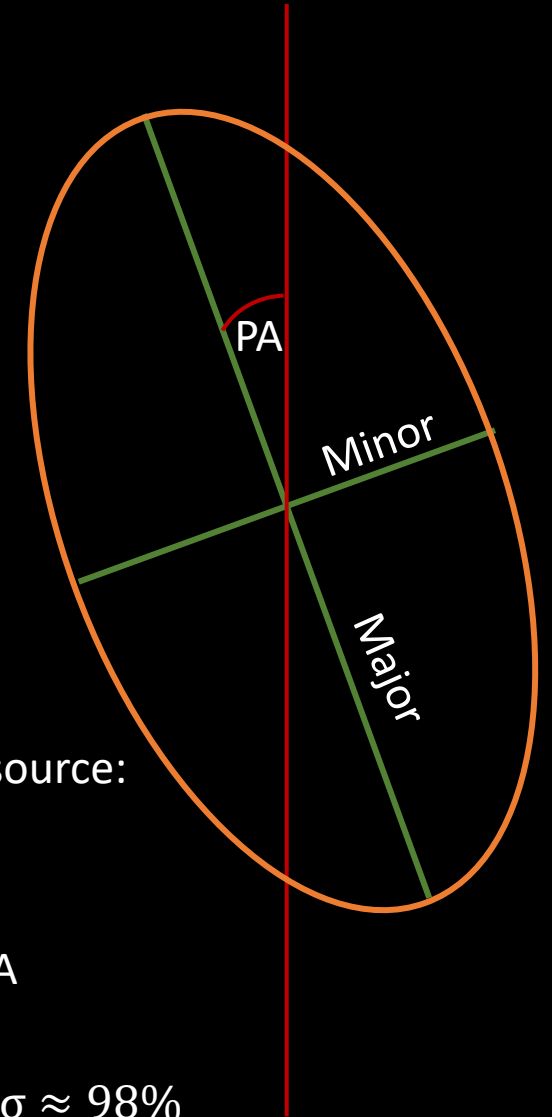
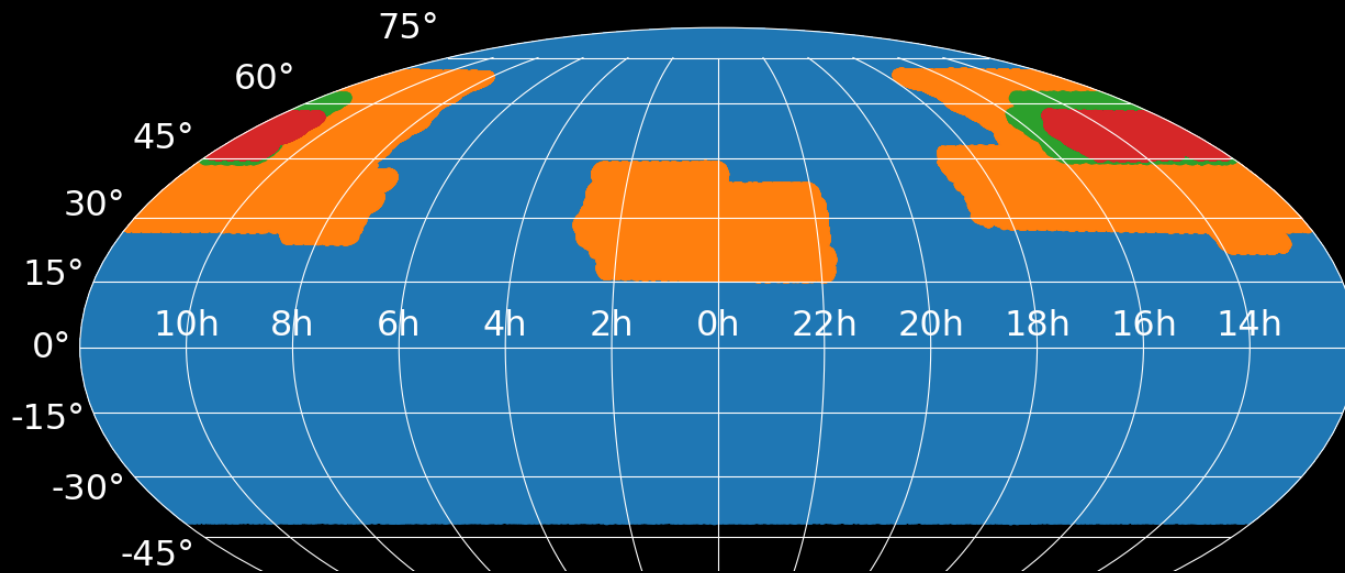
In collaboration with  
Francesco de Gasperin and  
Dominik Schwarz

# Data

## Survey name

## Sources in LoLSS region

LoLSS (de Gasperin et al. 2021)	25,247 (15,165 in LoTSS-DR1)
LoTSS-DR1 (Shimwell et al. 2019)	318,520
LoTSS-DR2 (internal release)	999,122
NVSS (Condon et al. 1998)	47,656



Gauss fits for every source:

-> Major axis

-> Minor axis

-> Positional angle PA

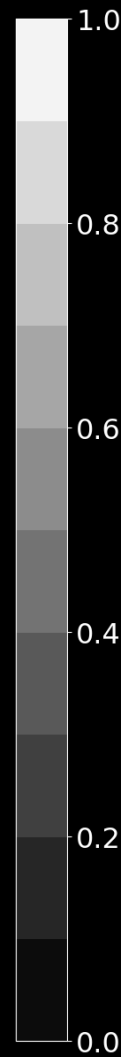
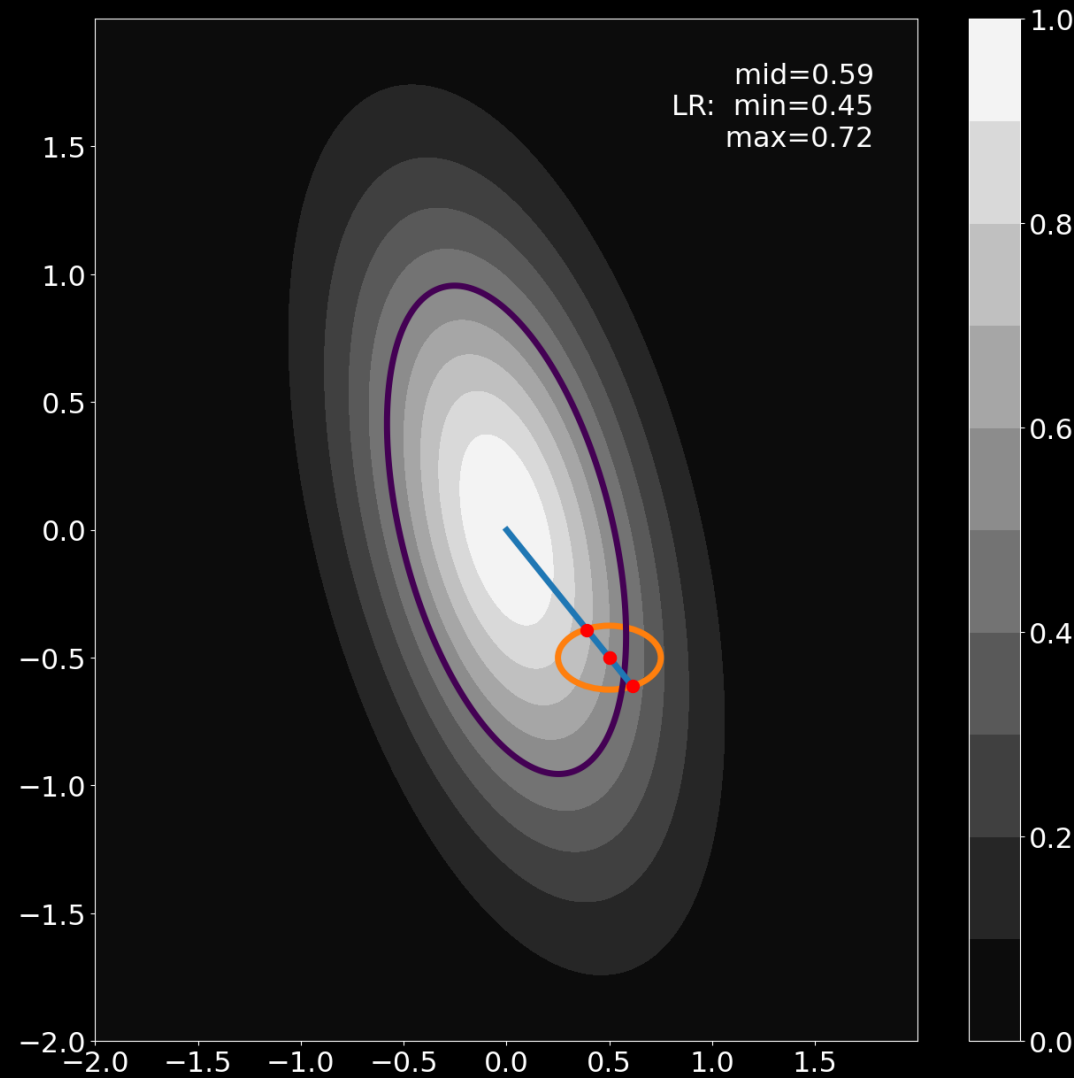
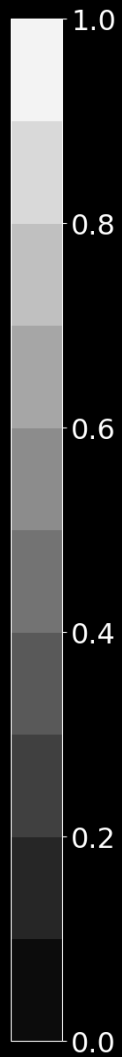
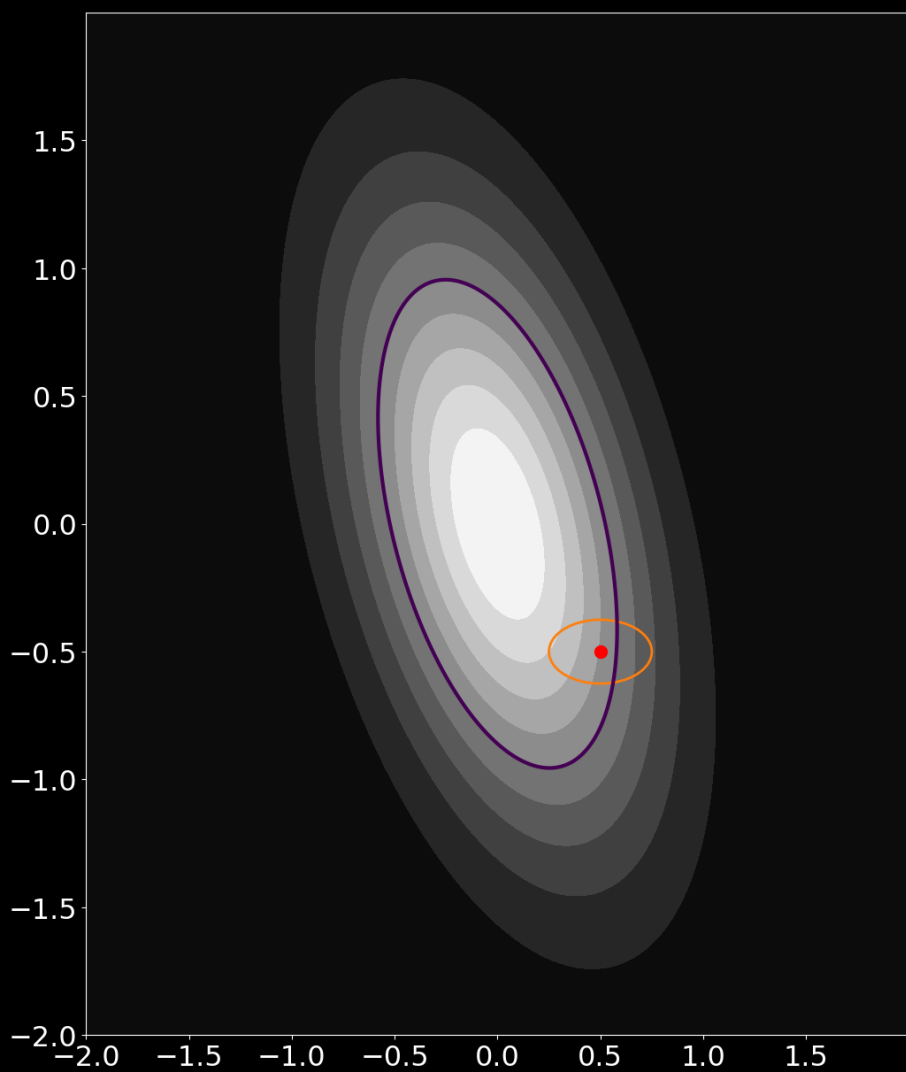
-> Fit includes  $2.355\sigma \approx 98\%$

Surveys:  
Data

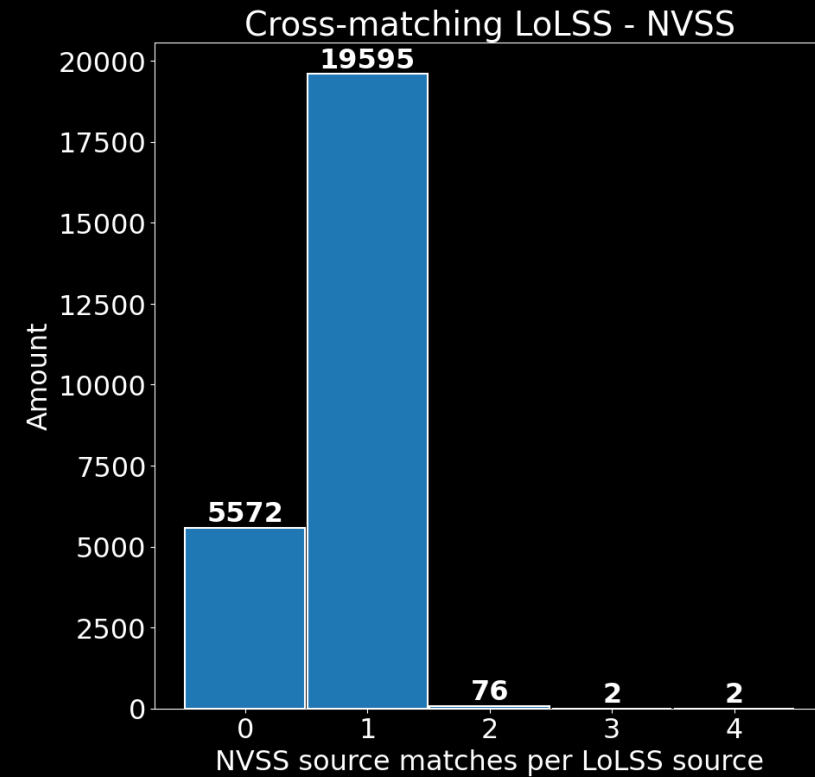
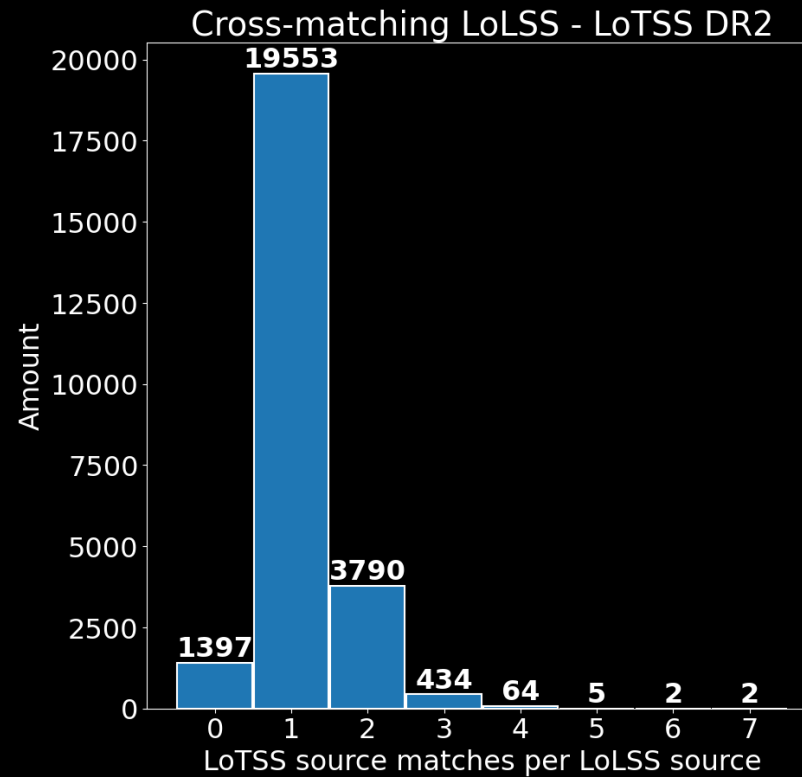
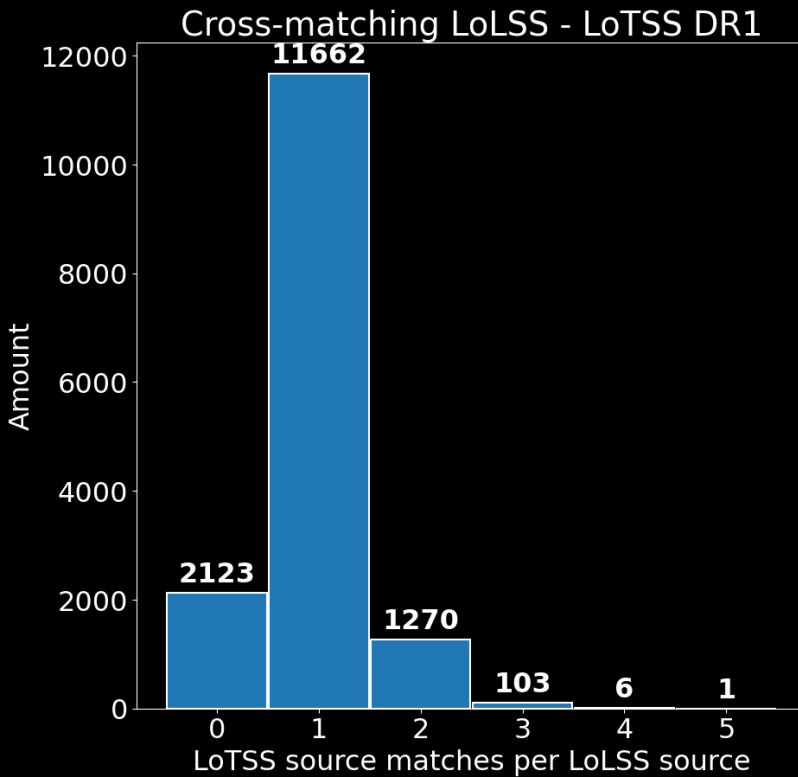
Cross-matching:  
Method | Result | Flux

Next steps

# A geometric method



# Result



19591 LoLSS sources have a match in LoTSS DR2 and NVSS  
2943 LoLSS sources have a match in LoTSS DR2 but not in NVSS

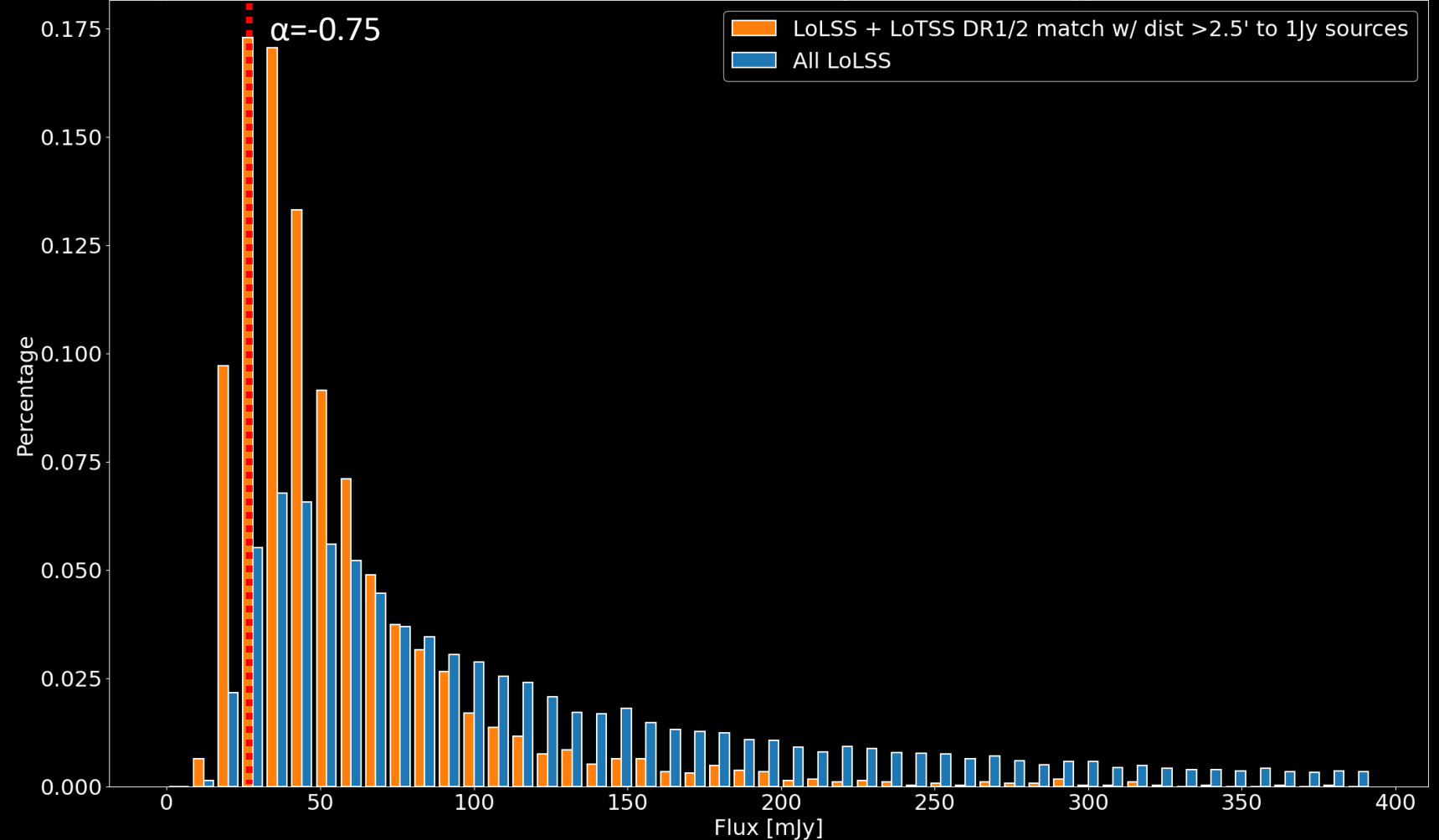
# Flux

LoLSS sources matched to LoTSS, but not NVSS sources, are steep spectrum candidates.

-> generally fainter, peak at 35mJy

2367 above steepness cut-off

Flux comparison for LoLSS + LoTSS DR1/2 match further away than 2.5' from 1Jy sources and all LoLSS sources



# Next steps

- Bayes Factor for matches (e.g. Budavari&Szalay, 2008)
  - Include size, angle
- Remove potential artifacts (close to bright source/survey edge)
- Analyse spectral slopes

=> Value added LoLSS