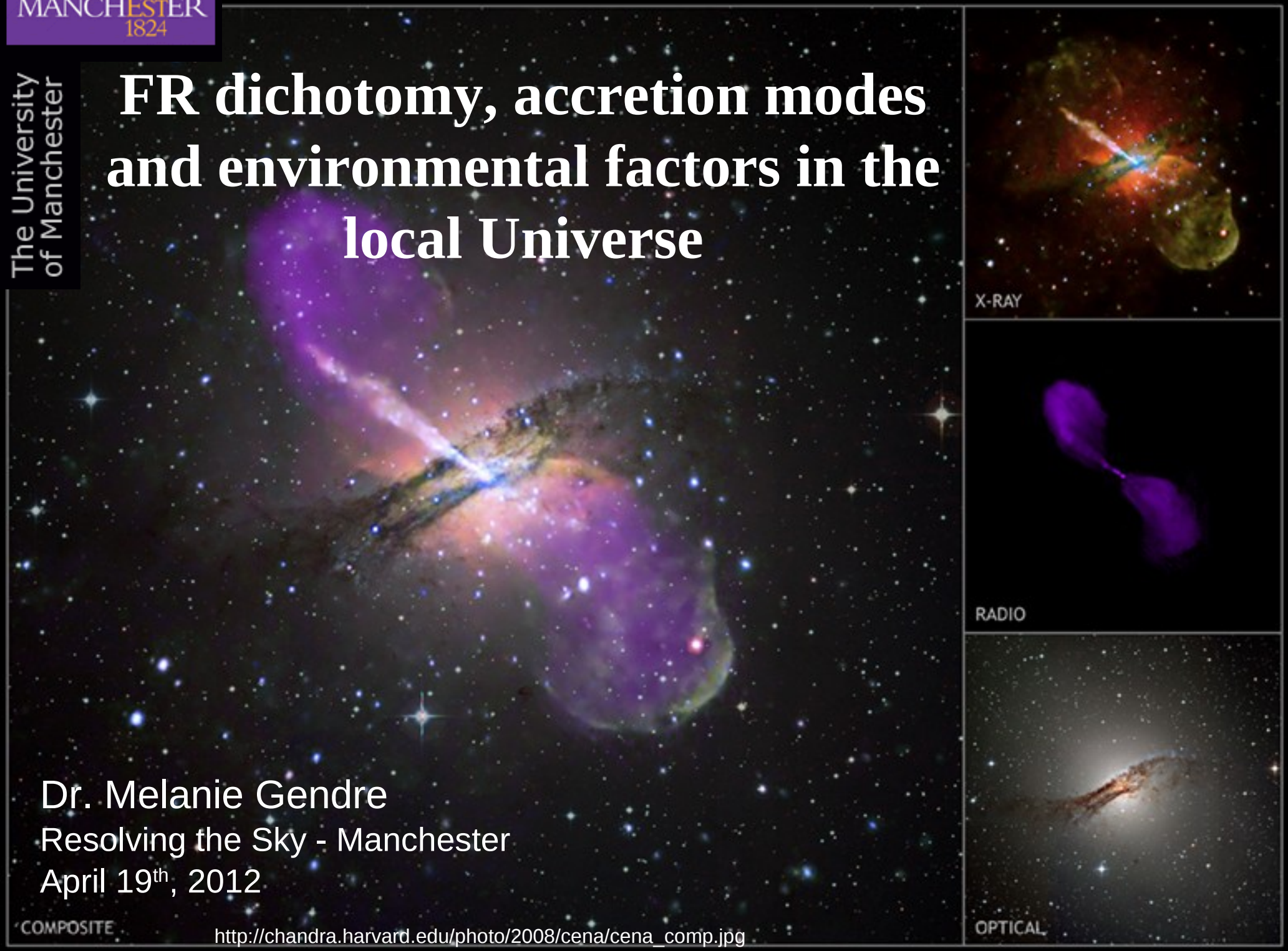
MANCHESTER 1824

The University of Manchester

FR dichotomy, accretion modes and environmental factors in the local Universe



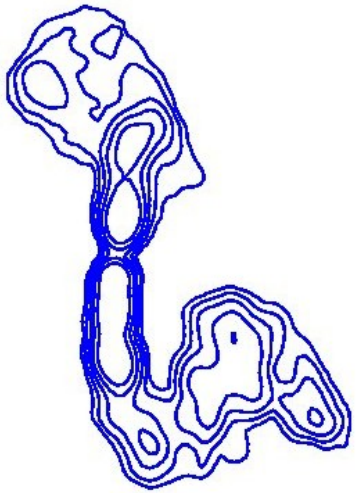
Dr. Melanie Gendre

Resolving the Sky - Manchester

April 19th, 2012

http://chandra.harvard.edu/photo/2008/cena/cena_comp.jpg

FR Dichotomy

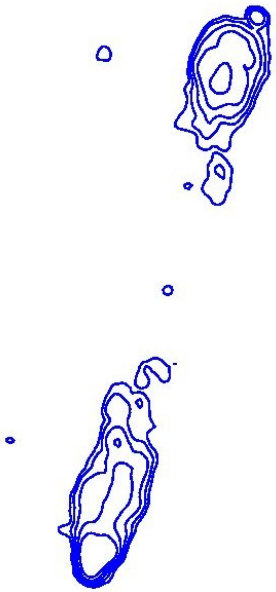


Characteristic example of FRI

→ highest surface brightness along the jets

→ include sources with irregular structure

→ tend to display lower luminosities



Characteristic example of FRII

→ highest surface brightness at the lobe extremities

→ more collimated jets

→ tend to display higher luminosities

Intrinsic vs. extrinsic models

Intrinsic vs. extrinsic

Properties of the central SMBH

Density of the IGM

Intrinsic vs. extrinsic models

Intrinsic vs. extrinsic

Properties of the central SMBH

↓

Quasar vs. radio-mode accretion

||

High vs. Low Excitation Galaxies

↓

Spectral features

[OII] & [OIII]

Density of the IGM

↓

Cluster richness

↓

Galaxy count

CoNIFG Local Sample

FR Dichotomy

Intrinsic vs. Extrinsic models

CoNFIG Local

HEG/LEG

Cluster Richness

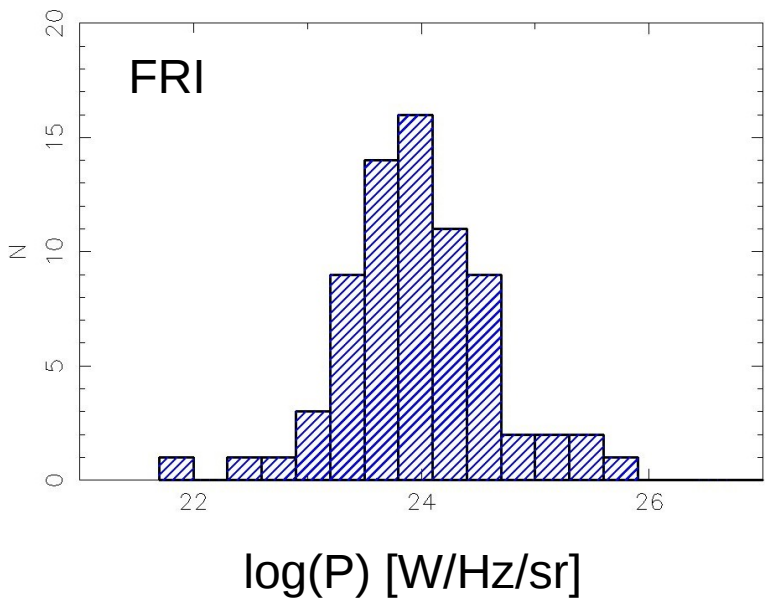
Host Galaxy Properties

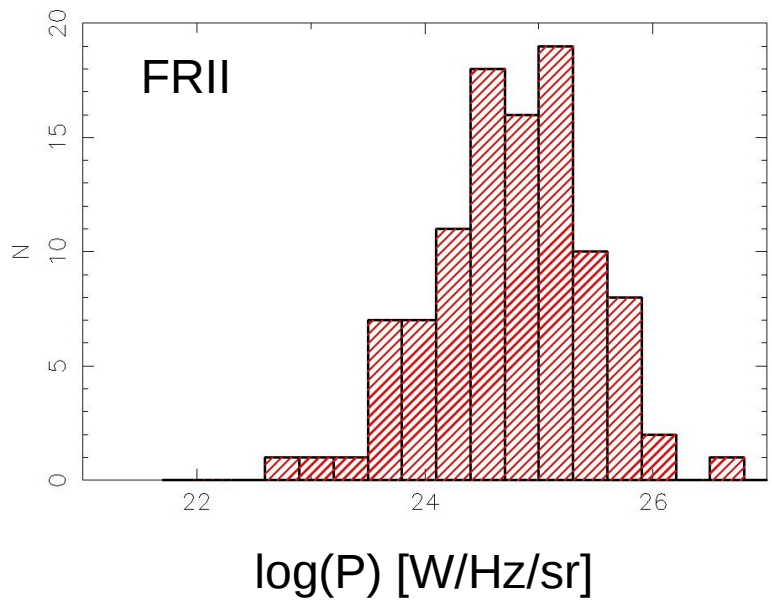
	S_{lim} (mJy)	A (deg^2)
3CRR	3500	14116
C1	1300	4924
C2	800	2915
C3	200	370
C4	50	52
CE	7.2	6

CoNFIG Local Sample ($z \leq 0.3$)

206 sources, (inc. 74 FRIs, 102 FRIIs)

76% with available spectra, mostly from SDSS.

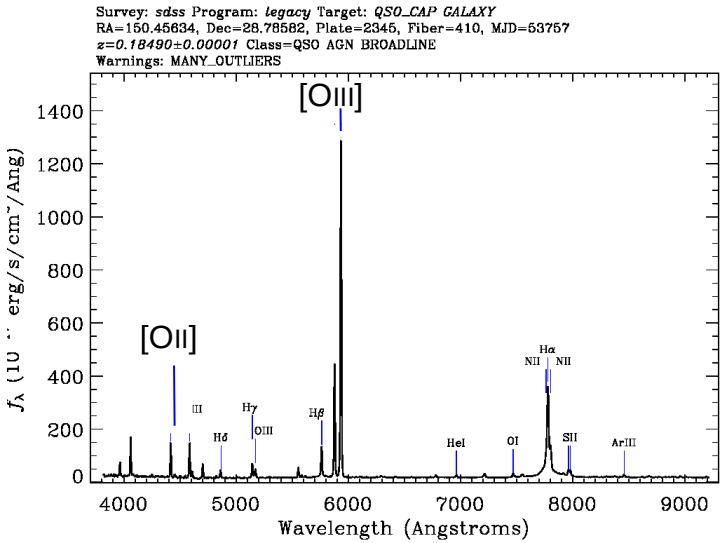




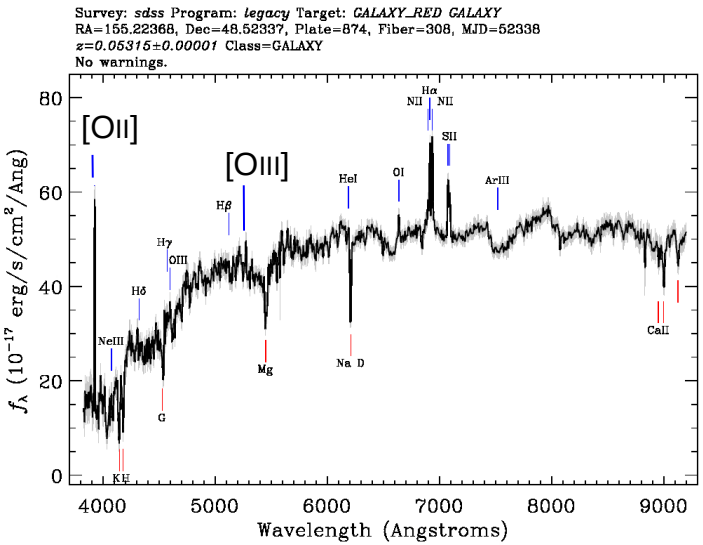
HEG/LEG

- Mostly SDSS spectra
- Measuring the [OIII] and [OII] lines
- Jackson & Rawlings (1997):

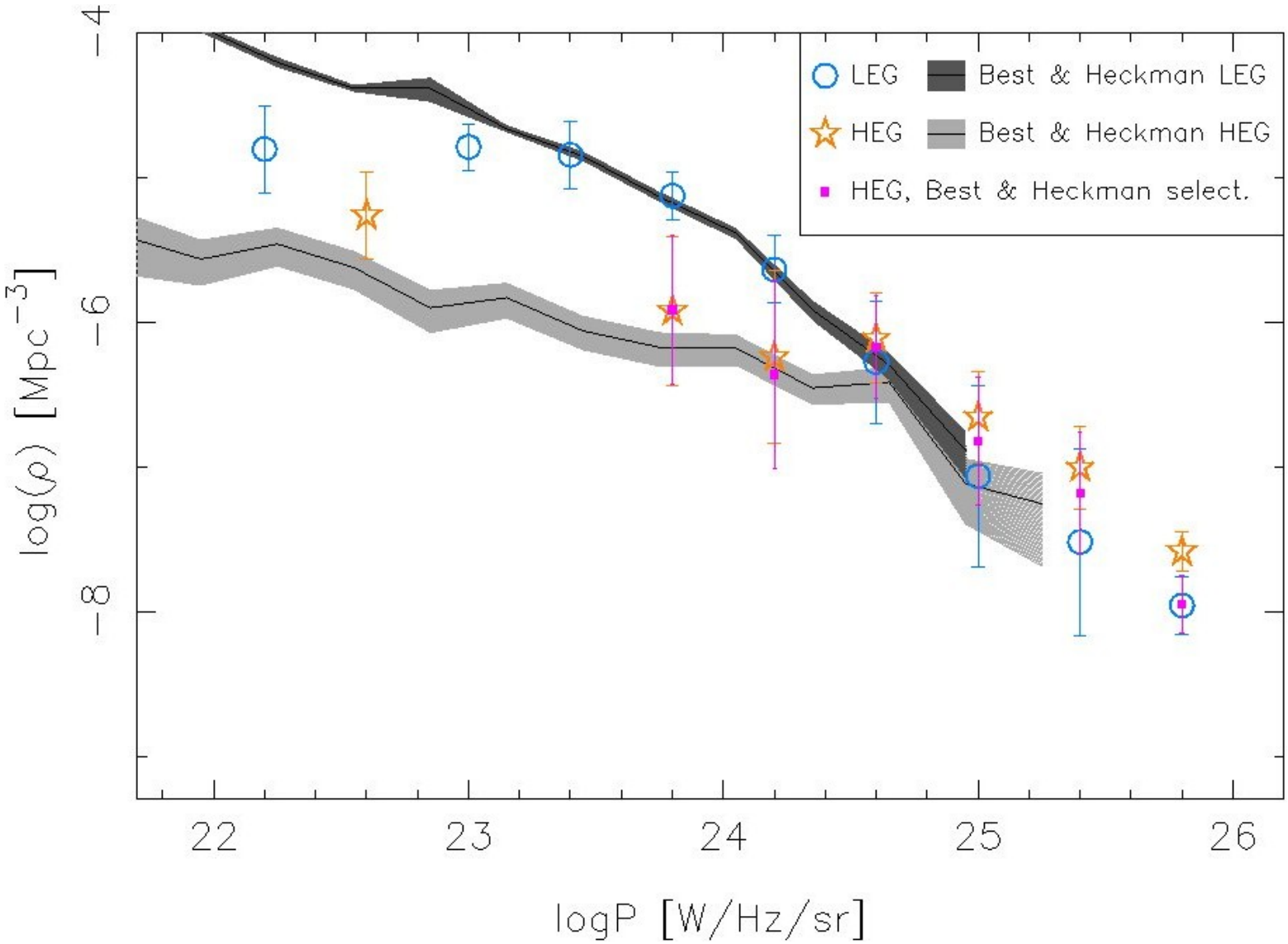
HEG: rest-frame [OIII] EW >1nm
OR/AND [OII]/[OIII] < 1



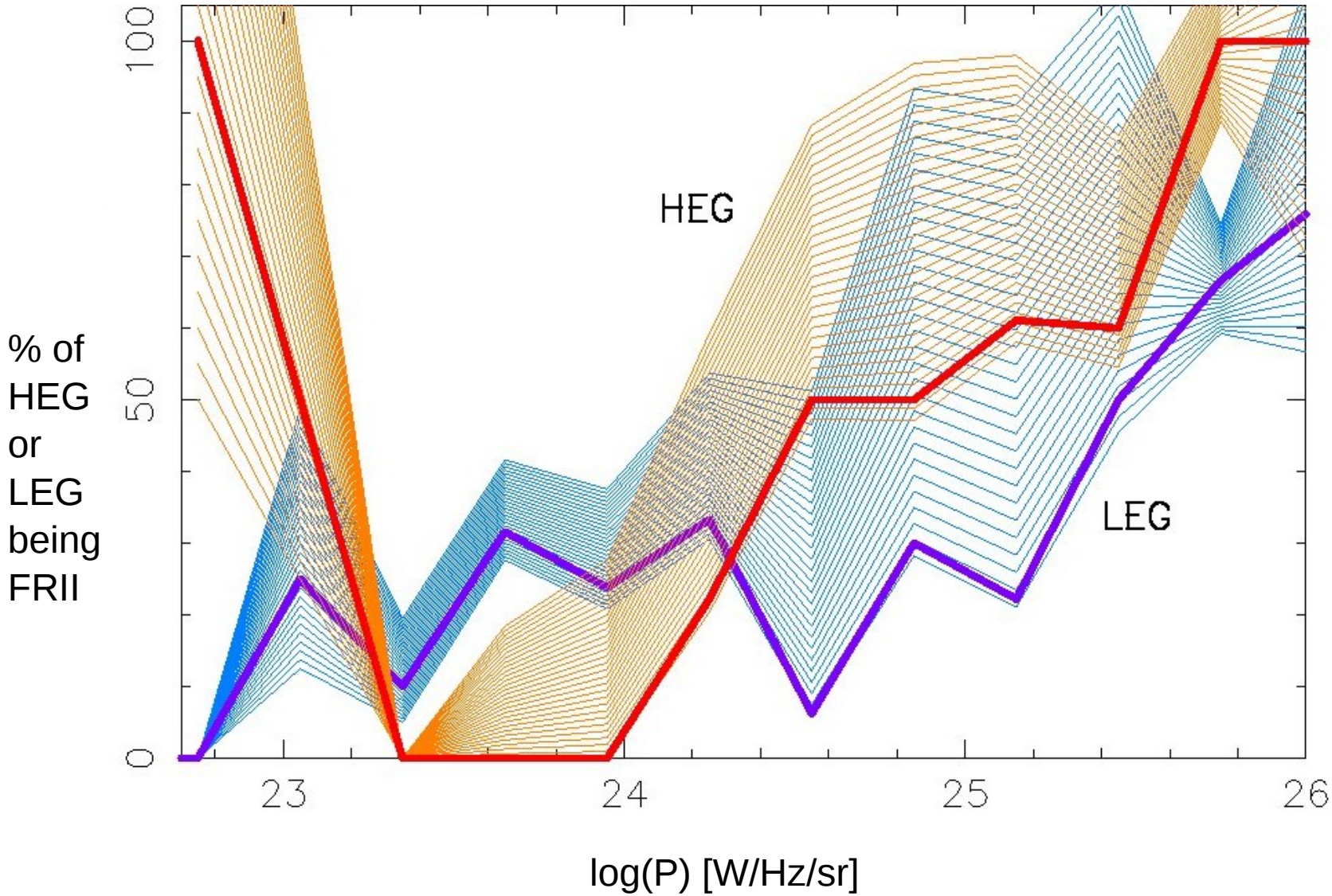
LEG: Not HEG OR
no [OIII] line detected



HEG/LEG

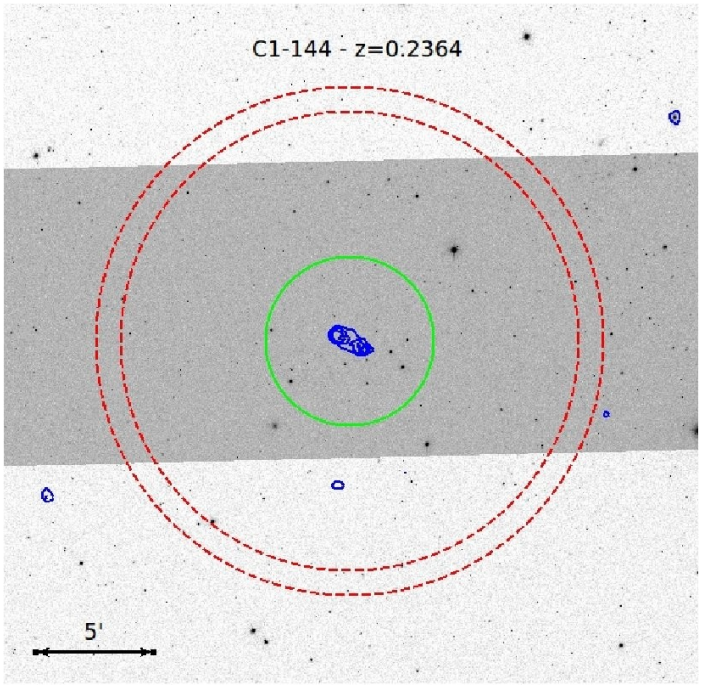


HEG/LEG



FR morphologies can not be distinguished solely based on the radio luminosity and accretion-mode of the source.

Including cluster richness



Richness factor N_1^{-19}

[Wing & Blanton (2011)]

Corrected (by subtracting background count) number of SDSS galaxies with absolute magnitudes brighter than M_r=-19 within a 1.0Mpc radius of the radio source.

Poor Cluster < N_1^{-19}=30 < Rich Cluster

Including cluster richness

FR Dichotomy

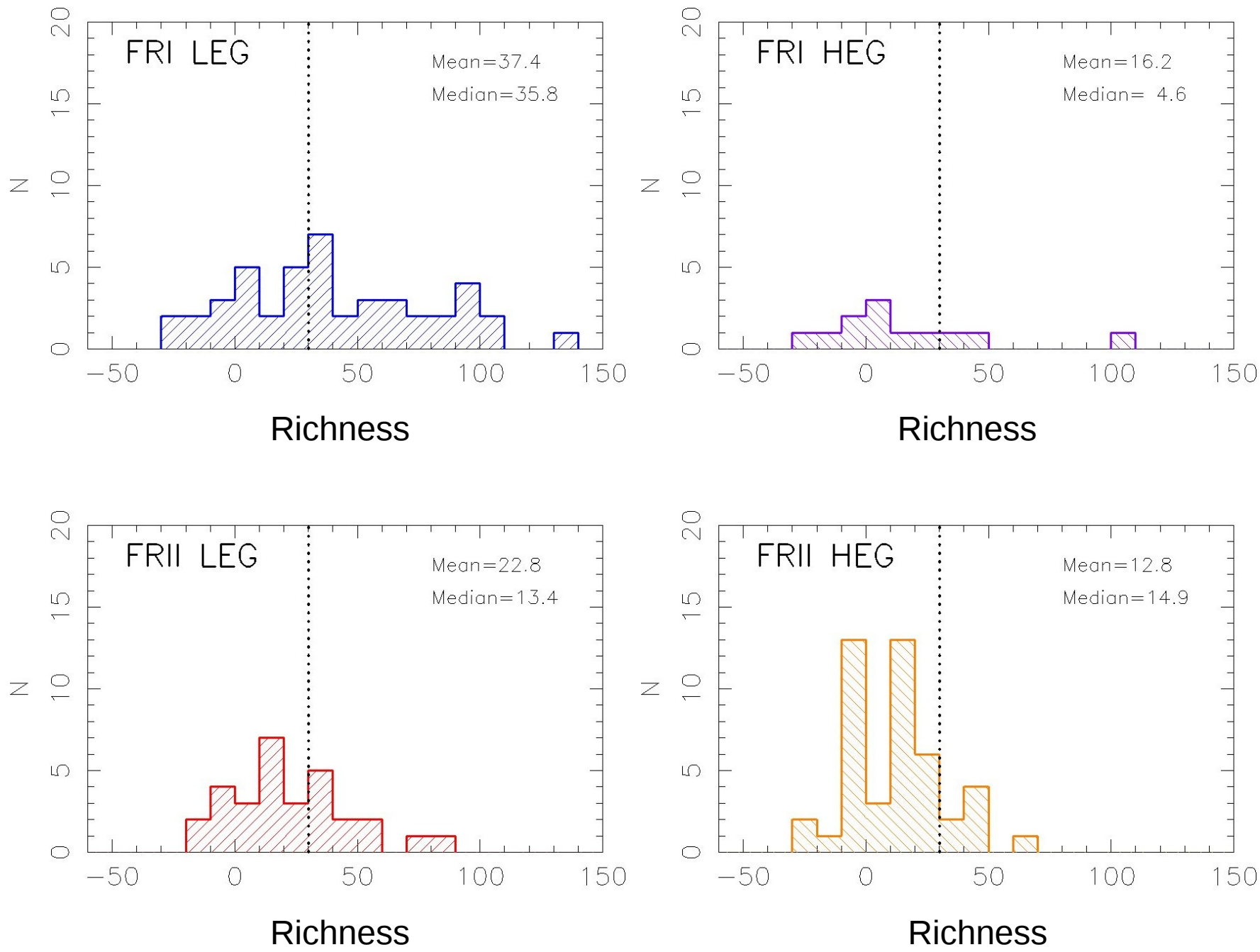
Intrinsic vs. Extrinsic models

CoNFIG Local

HEG/LEG

Cluster Richness

Host Galaxy Properties



Host galaxy properties

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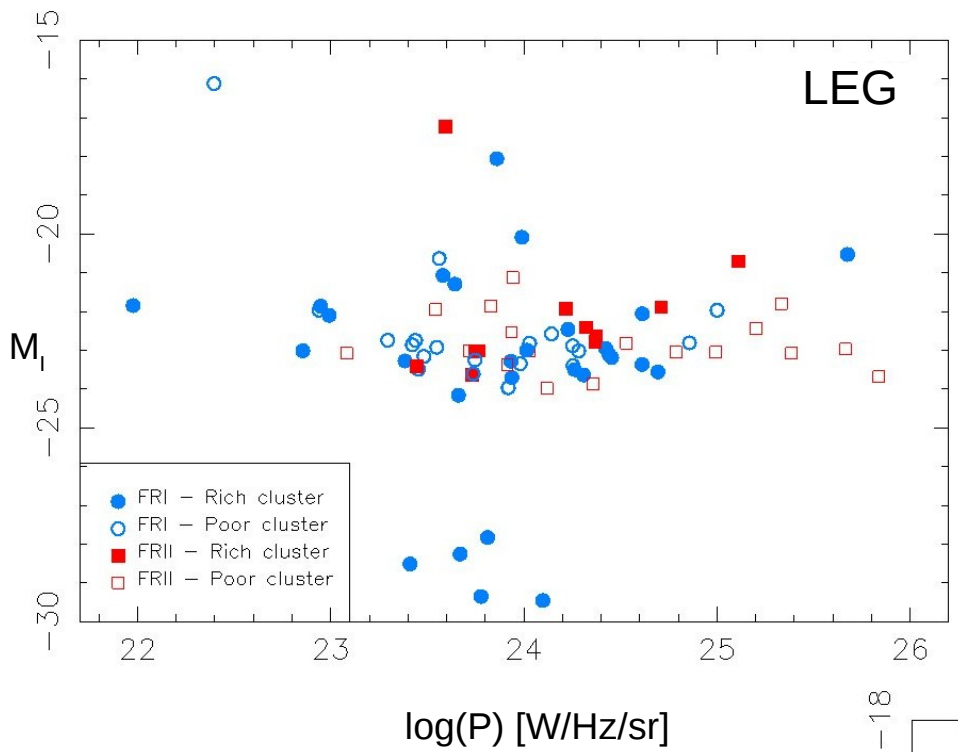

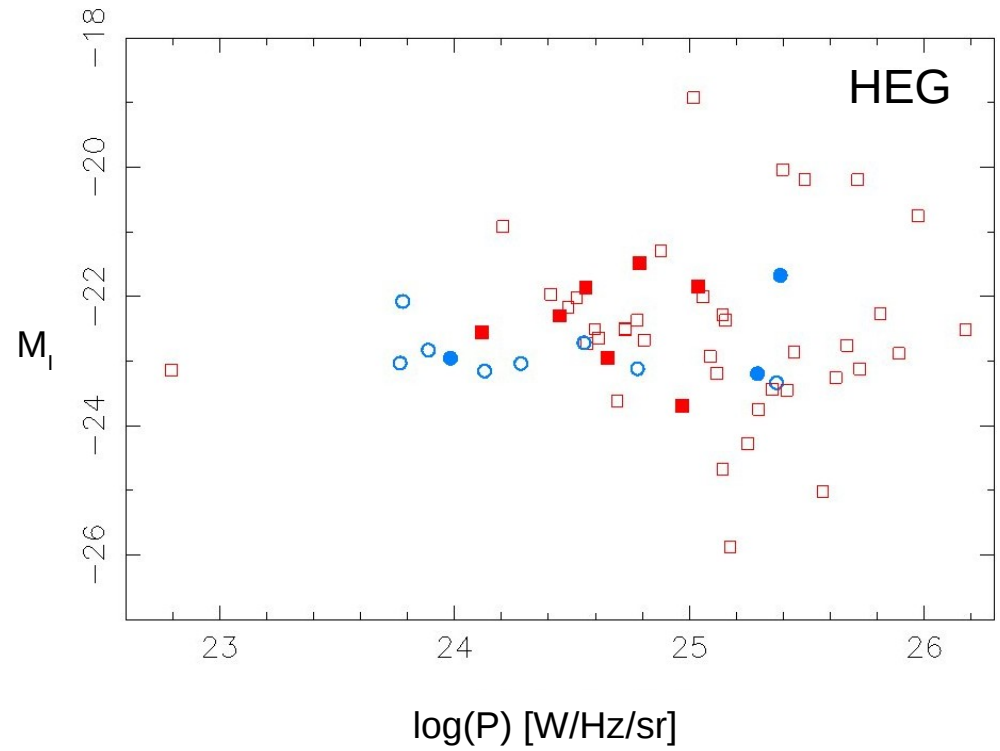

Host galaxy properties

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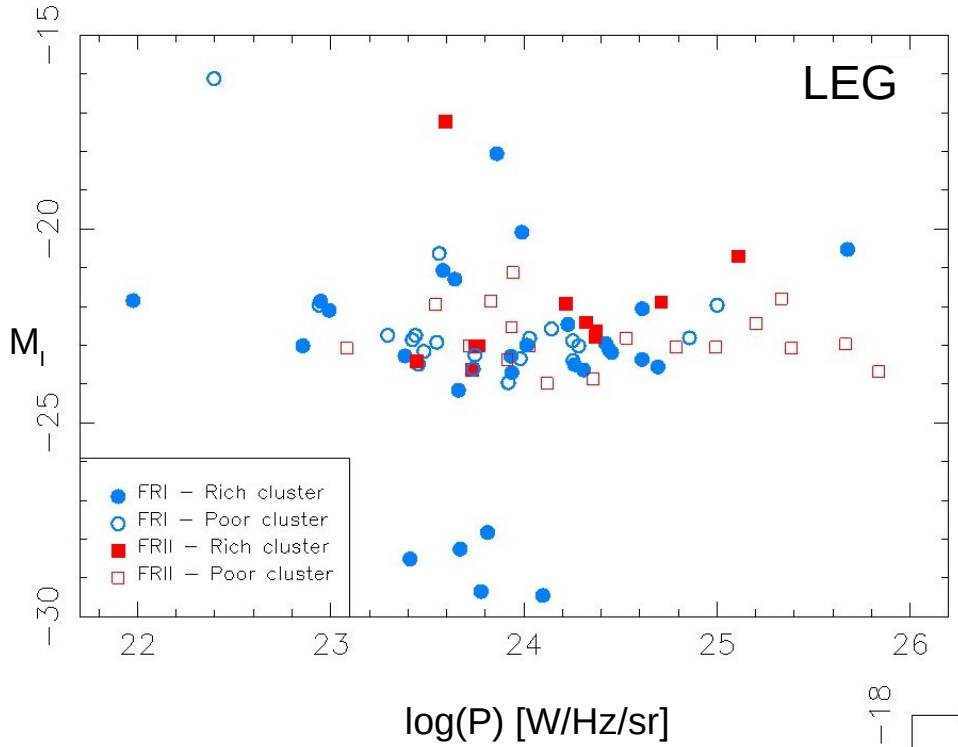
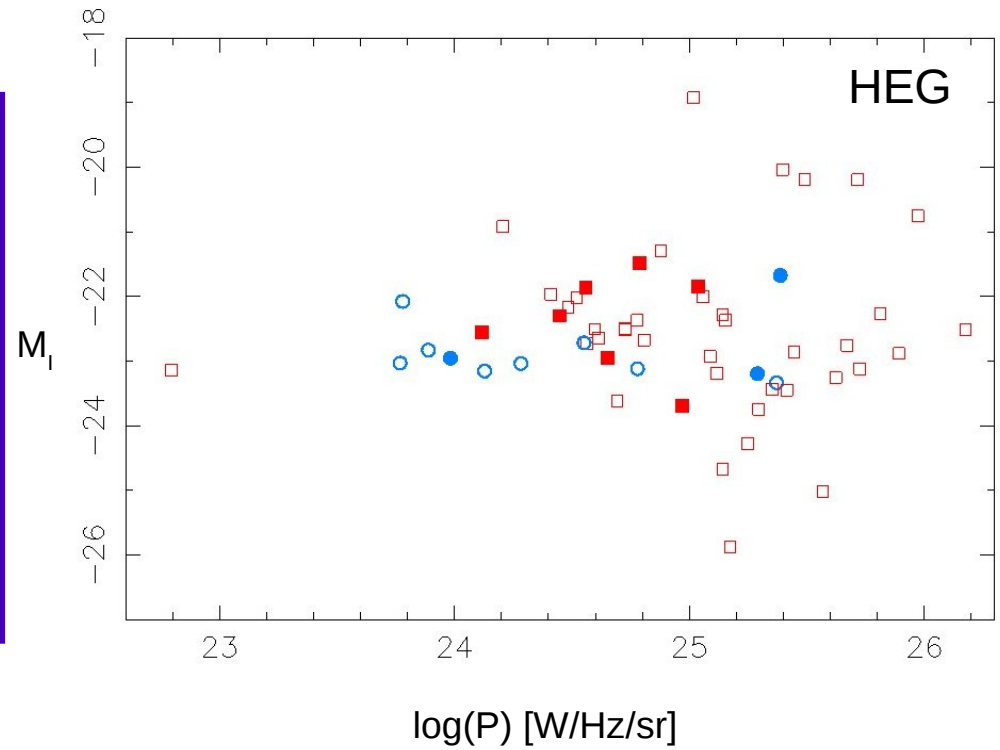


The combined knowledge of a source's optical and radio luminosities, environment, excitation mode and polarisation will not allow for the morphological classification of the object



THANK YOU

QUESTIONS?