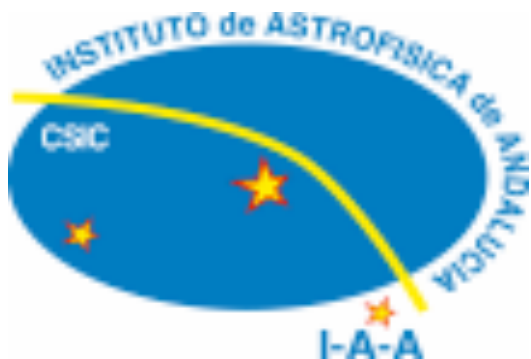


Synergies between the SKA and J-PAS

Miguel Pérez-Torres (IAA-CSIC & CEFCFA)
& Alberto Fernández-Soto
on behalf of the J-PAS collaboration



SP21-Science with the Panchromatic Large Surveys in the SKA era
EWASS 2015, 23 June 2015



J-PAS

**Javalambre Physics of
the Accelerating
Universe Astrophysical
Survey**



- IAA-CSIC (MICINN)
- CEFCA
- Observatorio Nacional, Rio de Janeiro
- Departamento de Astronomia, Universidade de São Paulo
- Centro Brasileiro de Pesquisas Físicas



JPAS in a nutshell

- Very wide field cosmological survey
- Dedicated 2.5 m telescope @ OAJ
- 54 narrow band and 5 broad band filters
- Camera with 1.2 Gpix, and $\text{FoV}=4.7 \text{ deg}^2$



JPAS in a nutshell

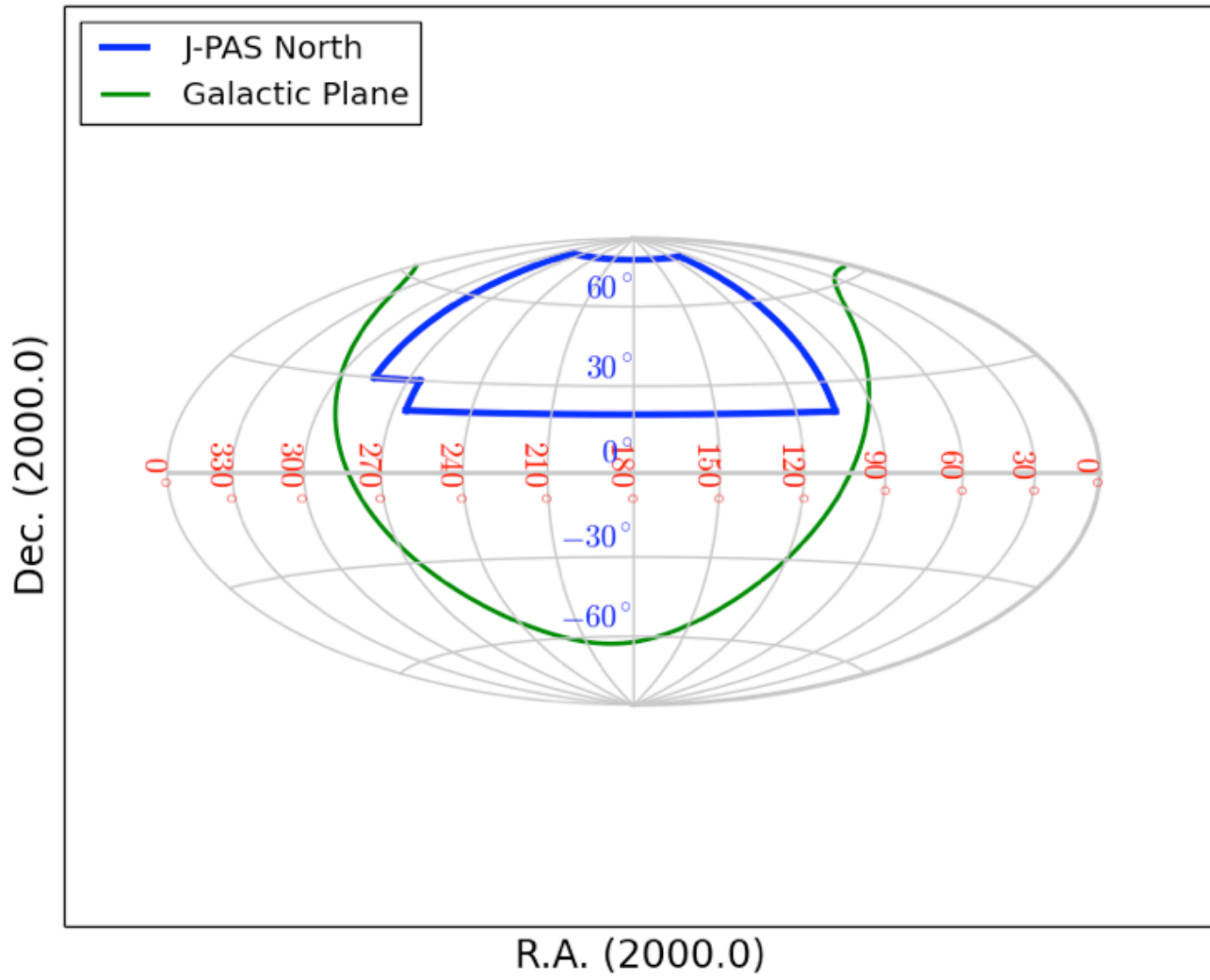
- To start in 2015
- Image $\sim 8500 \text{ deg}^2$ (=1/5 of the whole sky)
- Obtain deep, sub-arcsec imaging
- Obtain photometric redshifts (z) for ~ 90 million galaxies, with high precision:
 $dz/(1+z) \leq 0.003$
- 50x more than any current spectroscopic survey, up to $z=1.3$ ($V = 14 \text{ Gpc}^3$)

JPAS in a nutshell

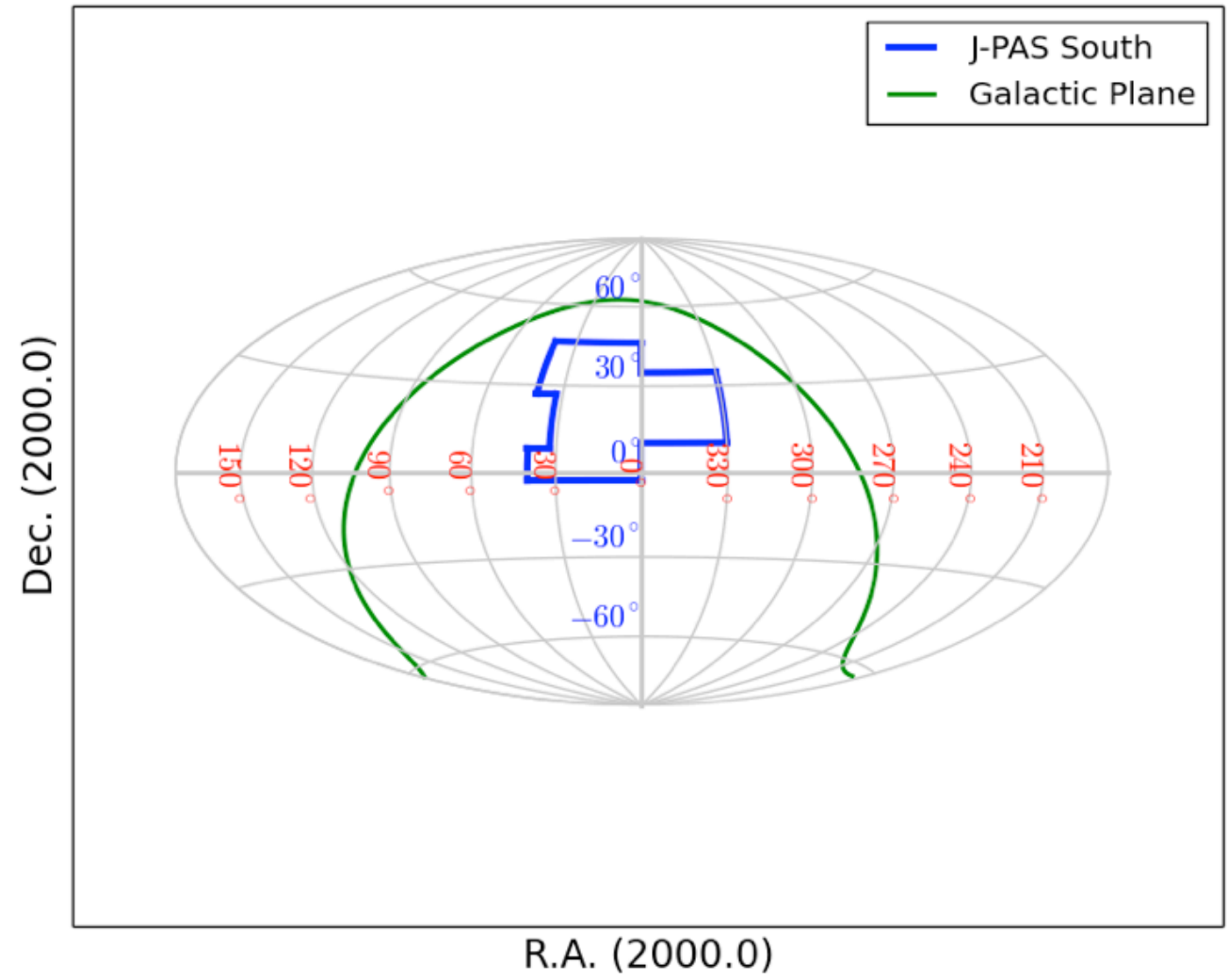
- Sub-arcsec + photo-z => extremely **powerful cosmological survey**.
- Detection and measurement of the **mass for $7e5$ galaxy clusters**
- **Constraints on Dark Energy** rival state-of-the-art BAO measur.
- Spectral and time domain info => Self-contained surveys of all kinds.
 - Expected to detect ~ 6000 SN Ia.
 - **Unique data for** all major areas of astrophysics

J-PAS/J-PLUS Footprint

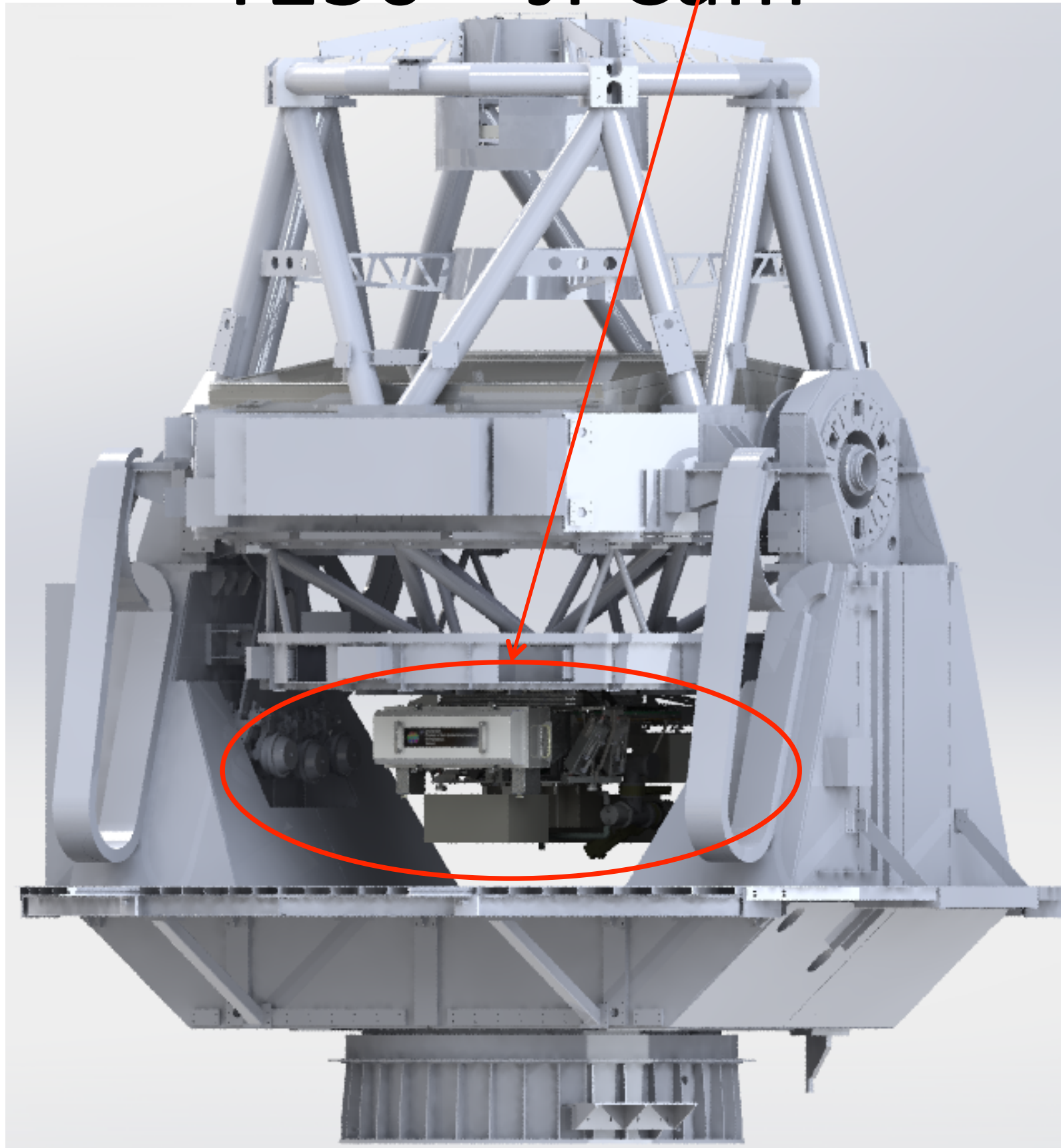
Northern Galactic Hemisphere



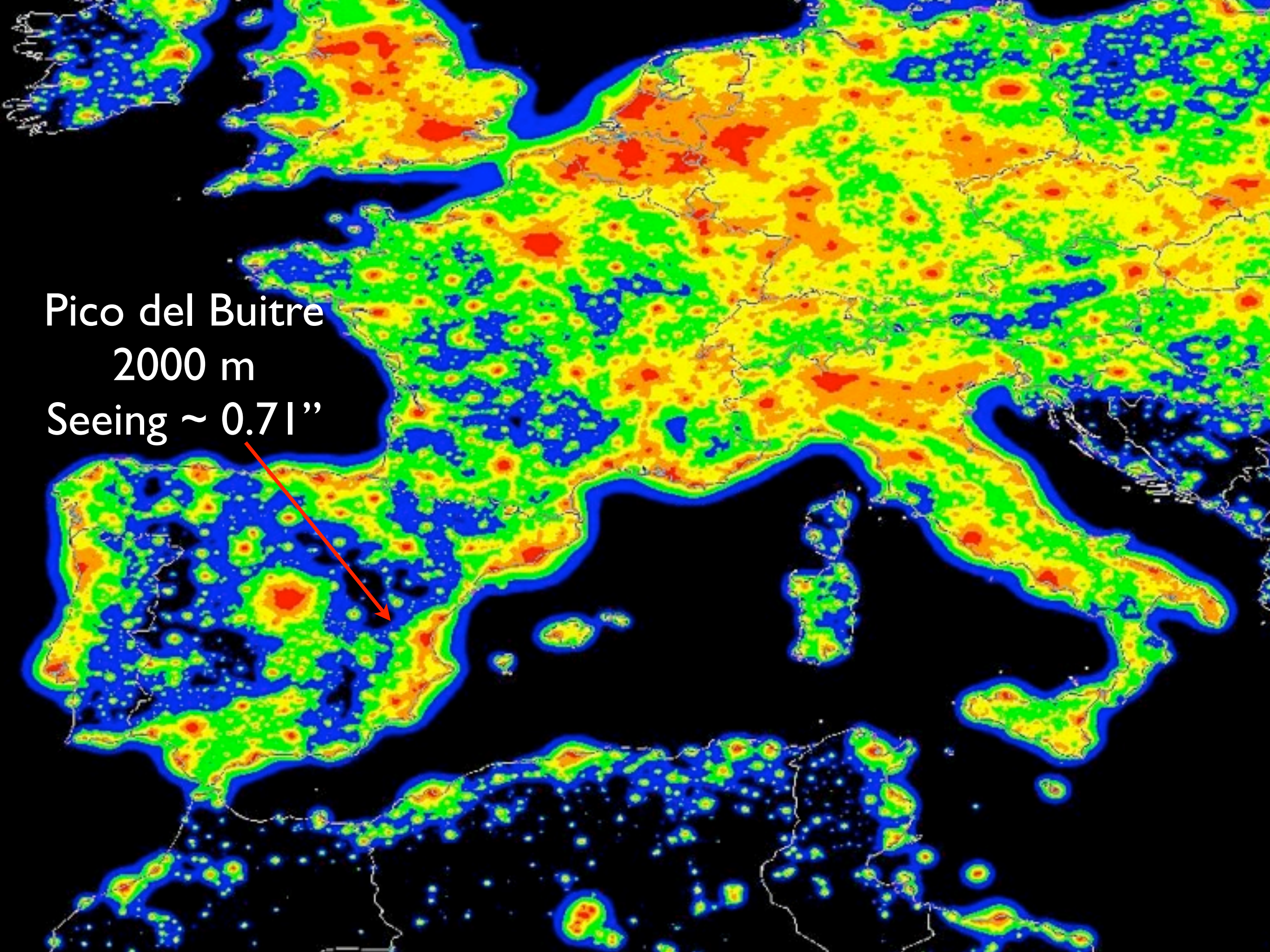
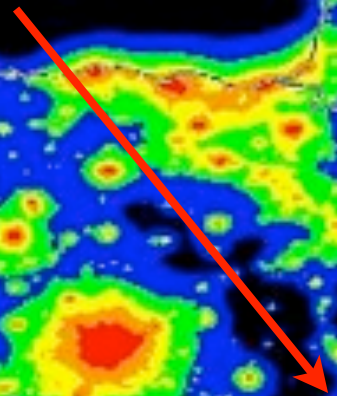
Southern Galactic Hemisphere



T250 + JPCam



Pico del Buitre
2000 m
Seeing $\sim 0.71''$





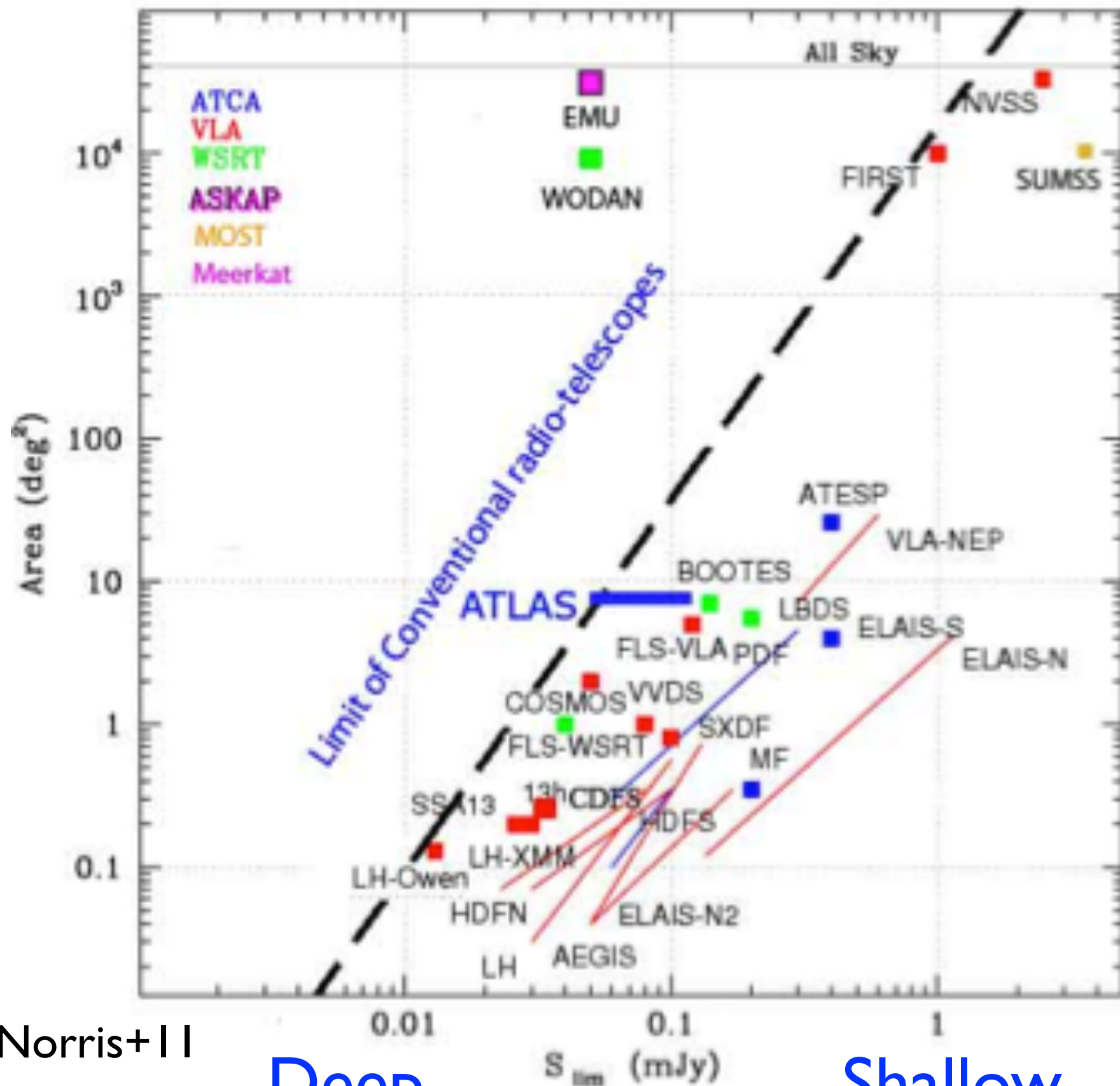




- LOFAR
- APERTIF
- ASKAP
- MeerKAT
- MWA
- ...

Current and future radio continuum surveys to understand galaxy formation and evolution through cosmic time as well to study transients.

Radio continuum surveys



Wide

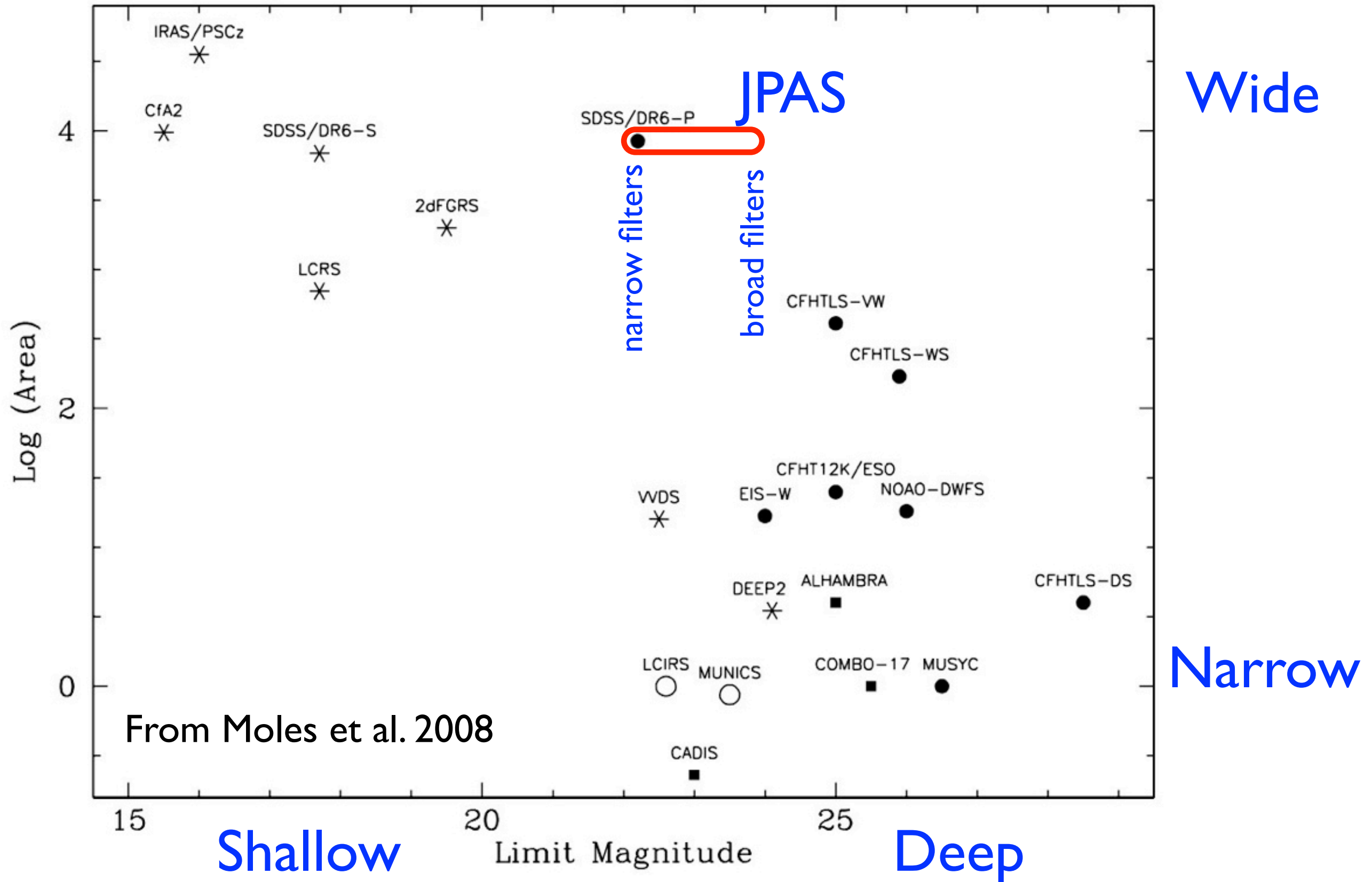
Narrow

From Norris+11

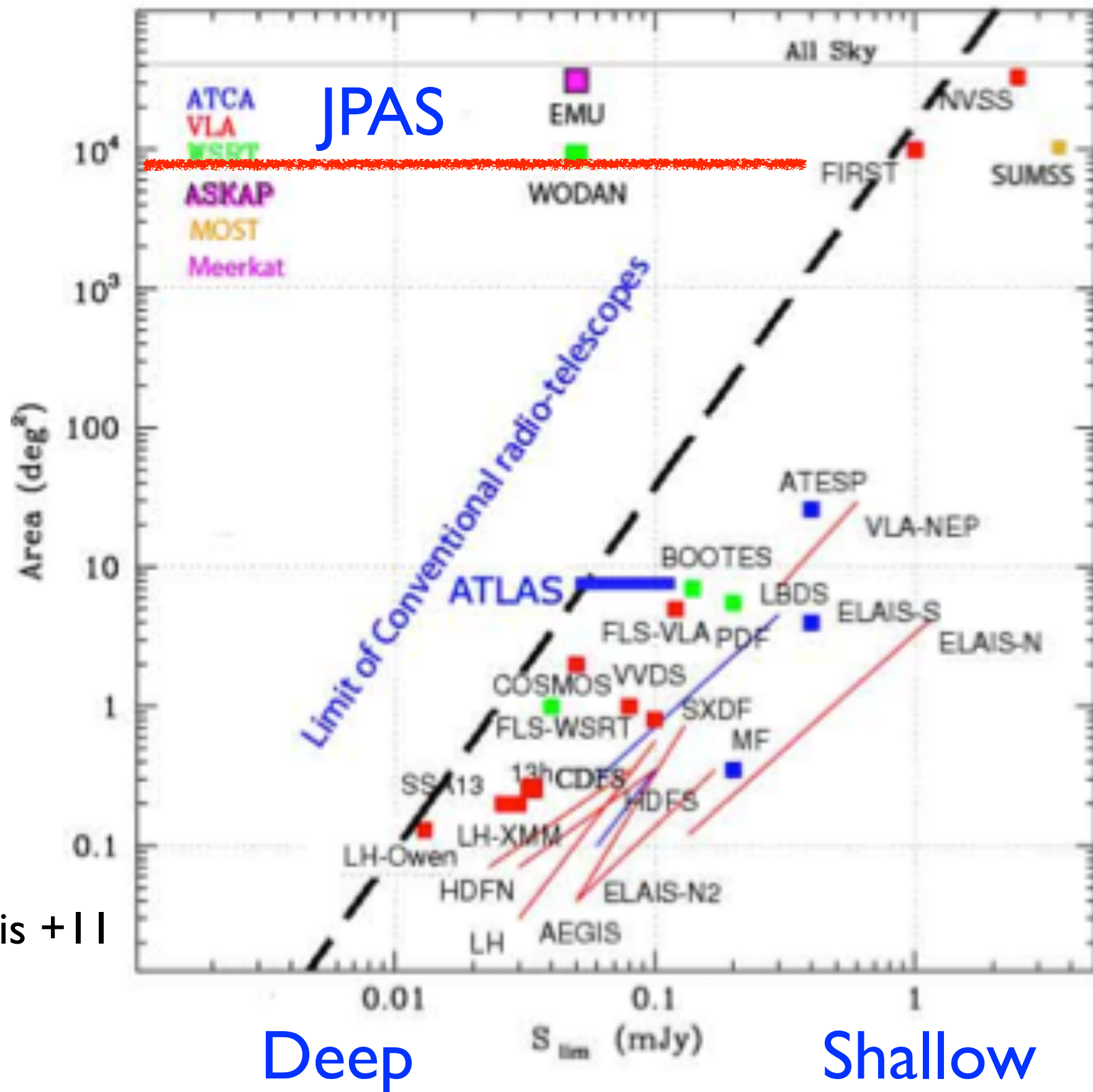
Deep

Shallow

Optical spectroscopic and photometric surveys



Radio continuum surveys



Norris + 11

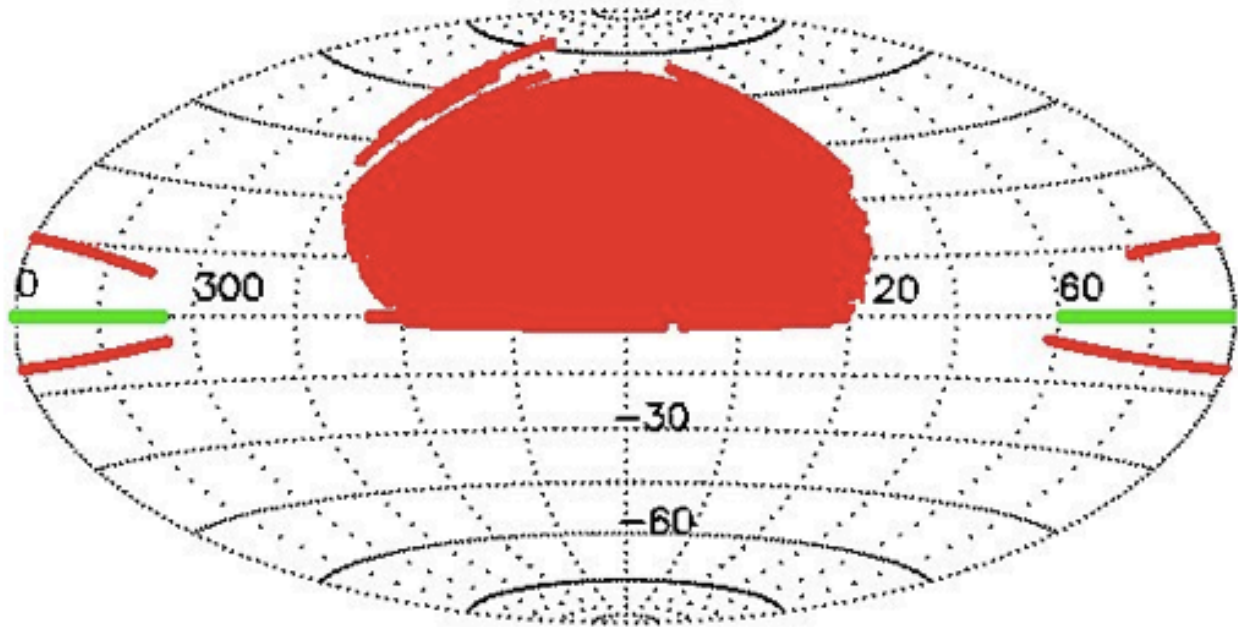
Wide

Narrow

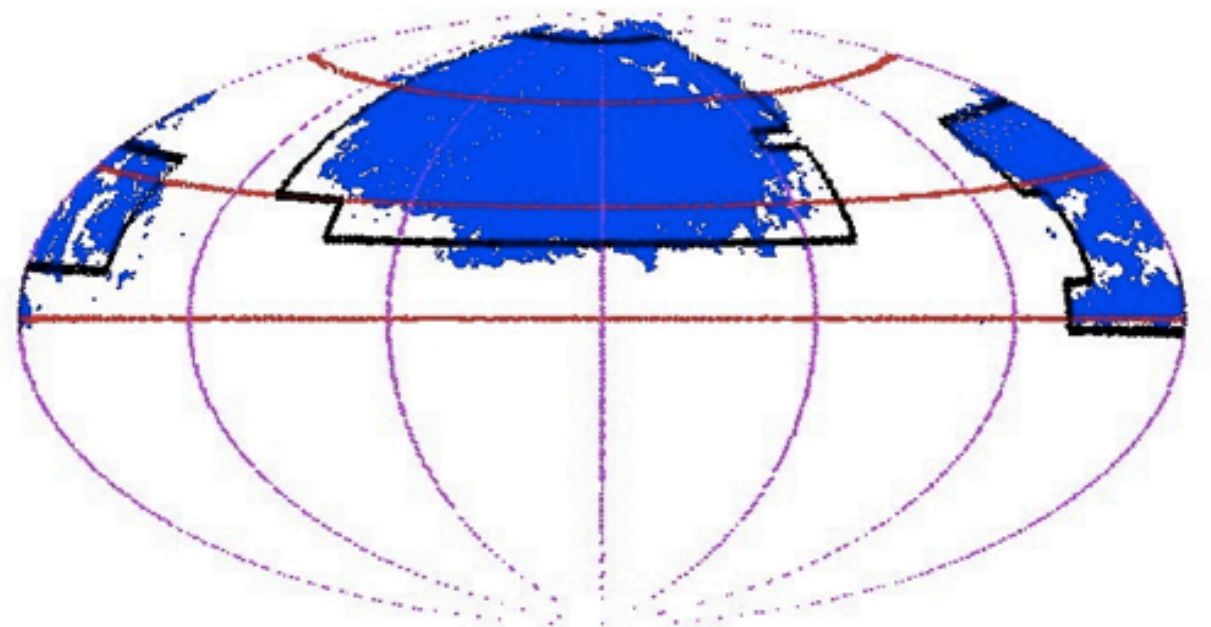
Deep

Shallow

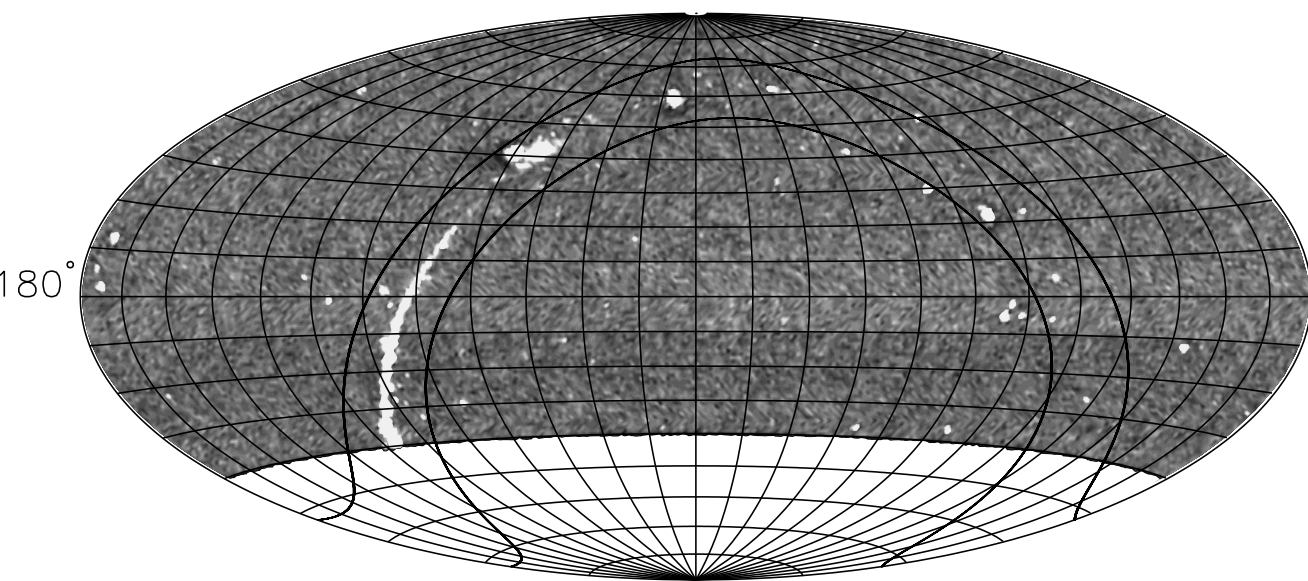
SDSS



J-PAS

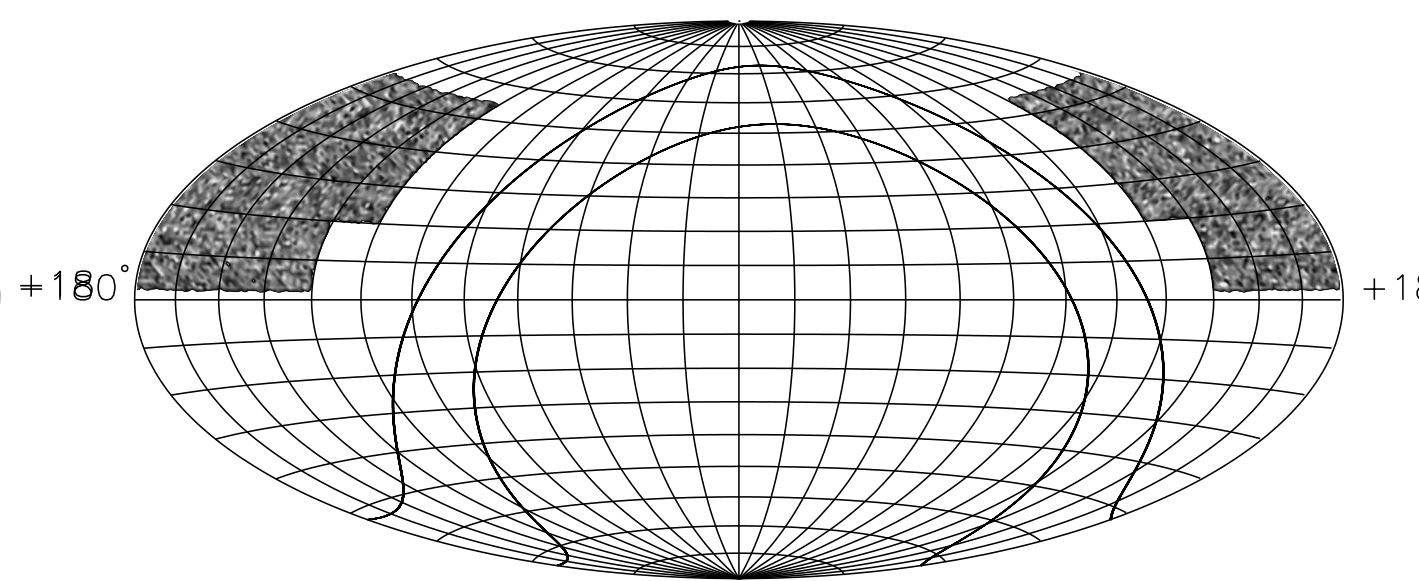


+90°



NVSS

+90°



FIRST

JPAS take-away messages

- Cross-correlating J-PAS with large radio surveys: NVSS, FIRST,...
- Redshifts largely cosmological, but for most radio sources still uncertain and currently only known statistically.
- Uncertainties in $N(z)$ and lack of direct identifications => limit many current studies of radio sources (clustering, ISW, environment, AGN feedback,...)
- JPAS/radio => reliable, very precise photo-z for ≥ 90 million gals
 - Extend studies of opt/radio correlations, currently limited to about $z=1.5$ to even larger z
 - Extend current studies up to $z=1.5$, but for a much fainter source radio population

The Spanish SKA White Book

The Spanish Square Kilometre
Array White Book

- 120 researchers
- 40 different institutions
- 29 chapters that cover most SKA key science cases
- Spanish astronomical community
- is ready to scientifically exploit the SKA
- shows its interest to enter the SKA project

Editors

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