SHORES

Serendipitous H-ATLAS fileds Observations of Radio Extragalactic Sources

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INTRODUCTION

The Serendipitous H-ATLAS fileds Observations of Radio Extragalactic Sources (SHORES, PI: Marcella Massardi) is a brand new survey 2.1 GHz performed with the Australia Telescope Compact Array.
It is composed by 30 discontinuous fields covering a total area of 15 sq. deg,. in the Herschel-ATLAS Southern Galactic Pole region (see Eales+2010) , centered in candidate lensed galaxies (Negrello+14).
With more than 200 hours of observing time we were able to reach ~ 30μJy sentivities (see Fig. 2 and 3).
These fields have the perks of covered by Herschel observations (H-ATLAS sgp) and many other surveys (KIDS, SDSS, GAMA...).

H-ATLAS

One of the main advantages of SHORES is the presence of panchromatic ancillary data. In particular, the fact that it is covered by the H-ATLAS survey allows us to retrieve information about the FIR properties of sources. Thus, we are able to study the dust emission and its interplay with the radio one. Further, the full characterization of the dust peak has a key role in the understanding of the photometric redshift and the SED-fitting.

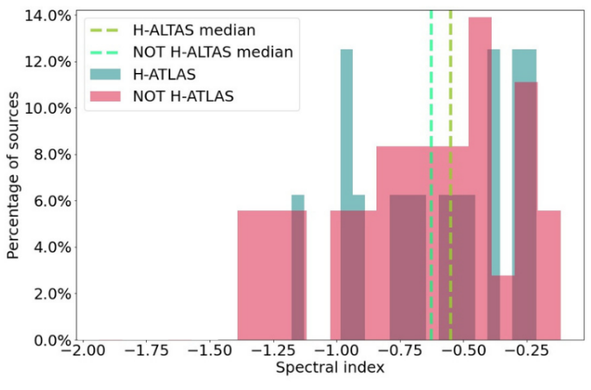

Fig. 4 Preliminar analysis of the spectral indexes in the SHORES deep field for the sources with (teal) and without (crimson) an H-ATLAS counterpart.

OBJECTIVES

With SHORES we aim at:

- characterizing the galactic populations in the radio bands up to high redshift
- reconstructing the radio luminosity function
- understanding the polarization of a wide range of galaxies populations

DEEP FIELD

We have done deeper 2 GHz observations in one of the 30 fields of SHORES, reaching a sensitivity of 0.5 mJy. This allows us to study star forming galaxies in the radio bands and to go towards higher redshifts.

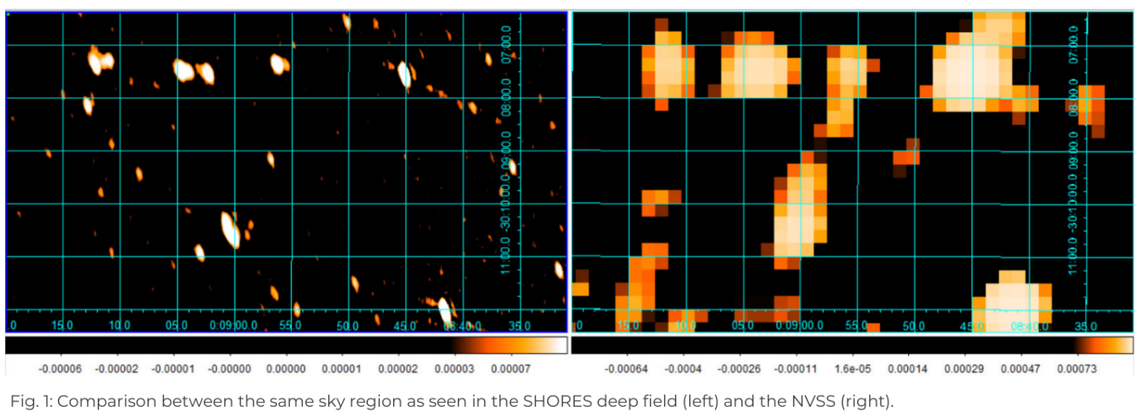

Fig. 1: Comparison between the same sky region as seen in the SHORES deep field (left) and the NVSS (right).

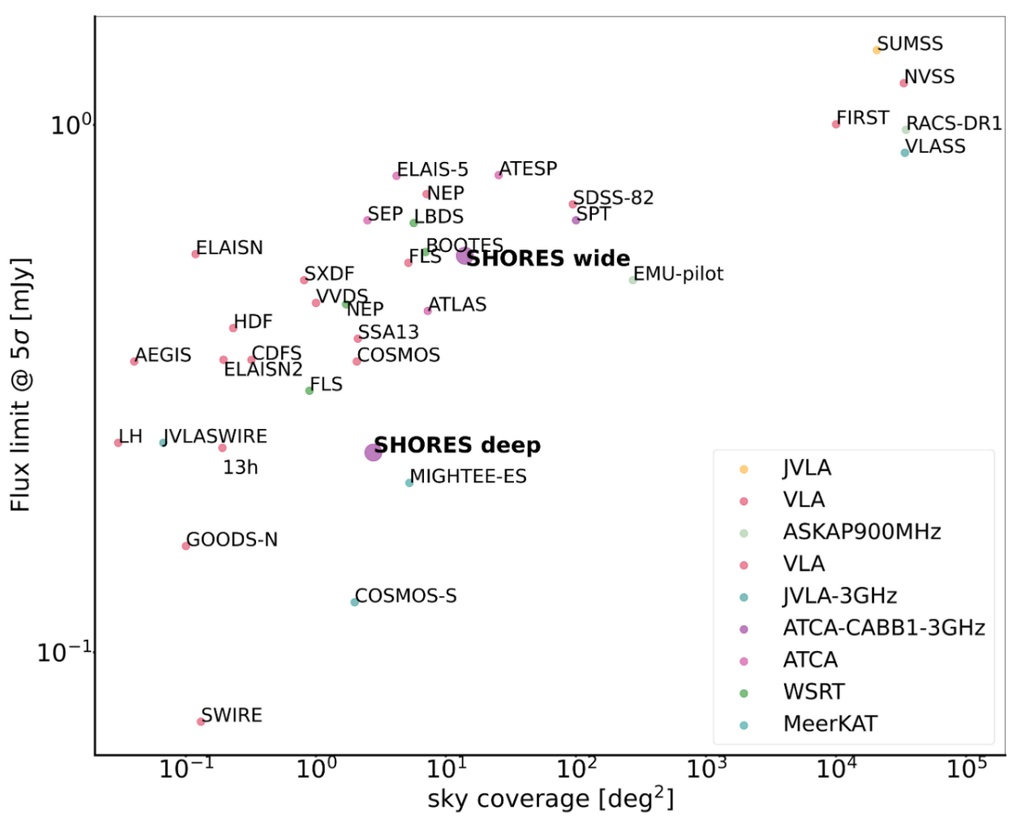

Fig. 2: Comparison between SHORES (deep and wide field) and the current state of the art

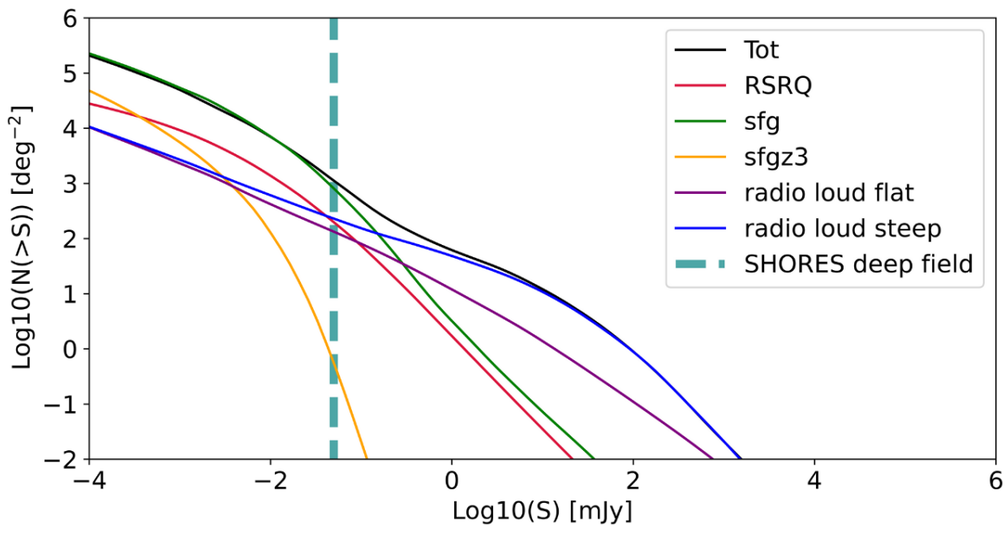

Fig. 3: Integrated radio number counts at 2 GHz from the differential number counts by Mancuso+17.

FOLLOW UPS

The deep field has been observed also at 5.5, 9 and 20 GHz. This makes us able to have a full characterization of the radio emission: these bands allow to disantangle between synchrotron and bremsstrahlung emission and to have reliable spectral indexes (see Fig. 4). The full understanding of the interplay between these processes is telling about the evolutionary stage and the age of the sources. Further, this implies being able to study the radio number counts on additional three bands.

POLARIZATION AND COSMOLOGICAL IMPLICATIONS

We have observed all the SHORES fields in polarization as well, taking advantage of the presence of polarized calibrators and of the high amount of observational time we got.
Combined with the sensitivity reached, this gives us the unique opportunity of studying the polarization properties not only of radio loud AGN but also of star forming galaxies and radio quiet AGN.
Further, retrieving the galaxies populations both in total intensity and polarization in such a wide area of the sky has implications on cosmology as well: AGN and star forming galaxies dominate the CMB foreground on the smaller angular scales.

RELATED LITERATURE

Eales+10; Negrello+14, Mancuso+17