VISTA NB118 observations in COSMOS: first results

Bo Milvang-Jensen, Johannes Zabl, Johan P. U. Fynbo, Wolfram Freudling, Palle Møller, Kim K. Nilsson, Henry Joy McCracken, Jens Hjorth, Olivier Le Fèvre, Lidia Tasca, James S. Dunlop, David Sobral, Marijn Franx, Adam Muzzin, Karina Caputi, Olivier Ilbert, Clotilde Laigle, Nawfel Bouflous, Olivier Herent & Patrick Hudelot

Dark Cosmology Centre

Introduction and data

We have purchased and installed 16 narrow-band filters (one per detector) in the VIRCAM camera on the 4-meter VISTA telescope at Paranal. These "NB118" filters have $\lambda \approx 1.19\,\mu$m, FWHM ≈ 12 nm and correspond to Hα at $z \approx 0.8$, [OIII] and Hβ at $z \approx 1.4$, [OII] at $z \approx 2.2$, and (when sufficent depth is reached) Lyα at $z \approx 8.8$.

We have observed $1.5^\circ \times 1.2^\circ$ of the COSMOS field in NB118, with half the area coming from our GTO programme (Milvang-Jensen et al. 2013), and the other half from DR3(*) from the on-going UltraVISTA survey (McCracken et al. 2012), see Fig. 1.

(*) The reduction of the future UltraVISTA DR3 is work in progress, and the only filter for which even a preliminary stack exists is NB118, which we use here, together with DR2 Y and J.

The plots are from Milvang-Jensen et al., in prep.

Results

Fig. 2, 3 & 4 show the colour-magnitude plot used to select objects with narrow-band excess (blue dots). Spectroscopically confirmed emitters are marked. In the analysis of the combined image (Fig. 4) we find 4300 objects with narrow-band excess at $\geq 3\sigma$.

Fig. 5 shows narrow-band excess vs spectroscopic redshift, illustrating that the narrow-band excess objects are line emitters. A few outliers are due to time variability between the NB118 (DR3) observations and the Y & J (DR2) observations.

Fig. 6 shows the photometric redshift histogram for the narrow-band excess sources (top) and all sources in the image (bottom). These photo-zs are independent of the NB118 fluxes. We also want to explore photo-zs that use NB118 as input.

We are working on improving the split of the sample into Hα (z=0.8), [OIII]+Hβ (z=1.4) and [OII] (z=2.2). Subsequently we will derive the LFs for these emitters.

Fig. 1: NB118 imaging in COSMOS

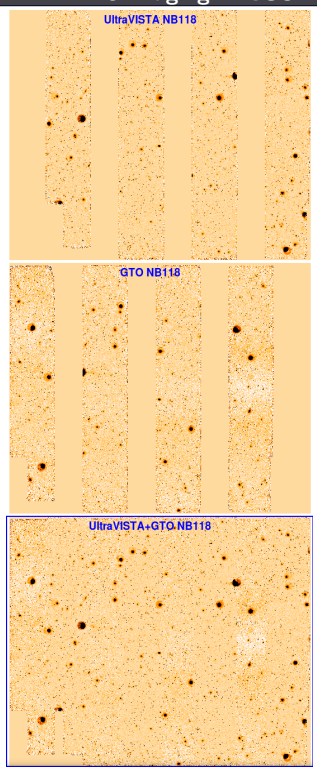


Fig. 2: Emission-line objects (blue dots), UltraVISTA pre. DR3 NB118

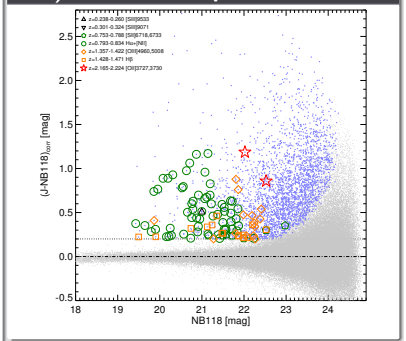


Fig. 3: Emission-line objects (blue dots), GTO NB118

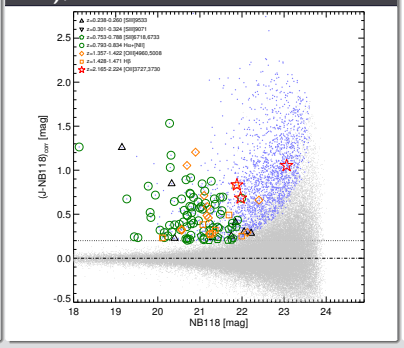


Fig. 4: Emission-line objects (blue dots), UltraVISTA prelim. DR3 + GTO

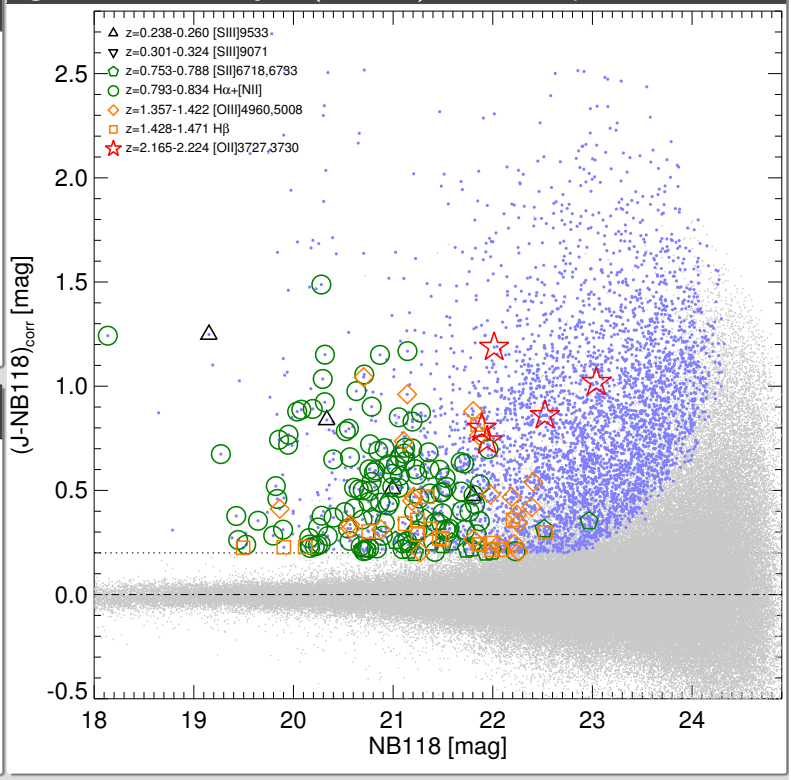


Fig. 5: Narrow-band excess vs spectro z, UltraVISTA pre. DR3 + GTO

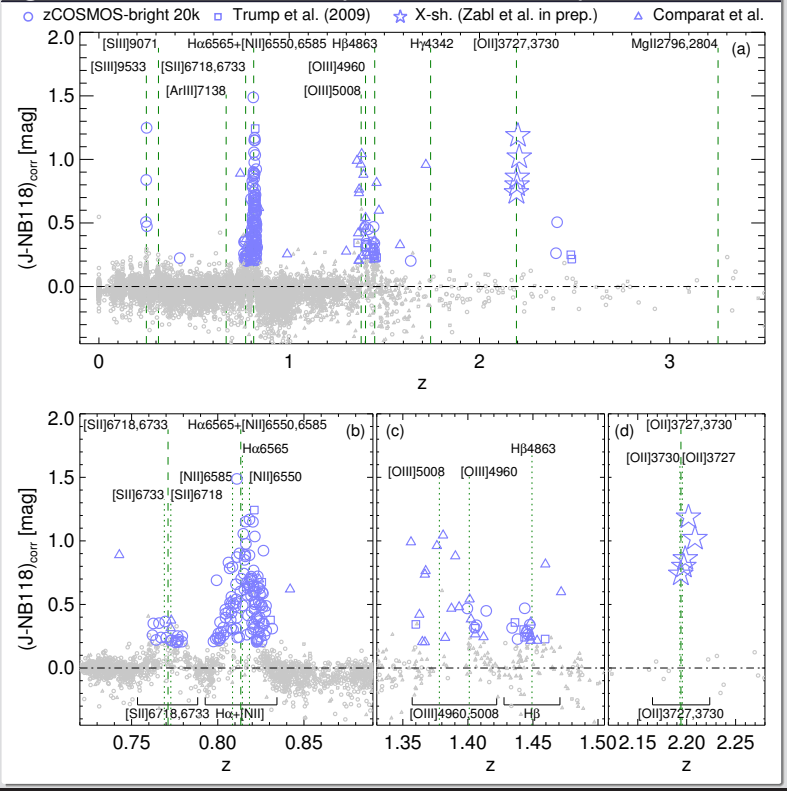
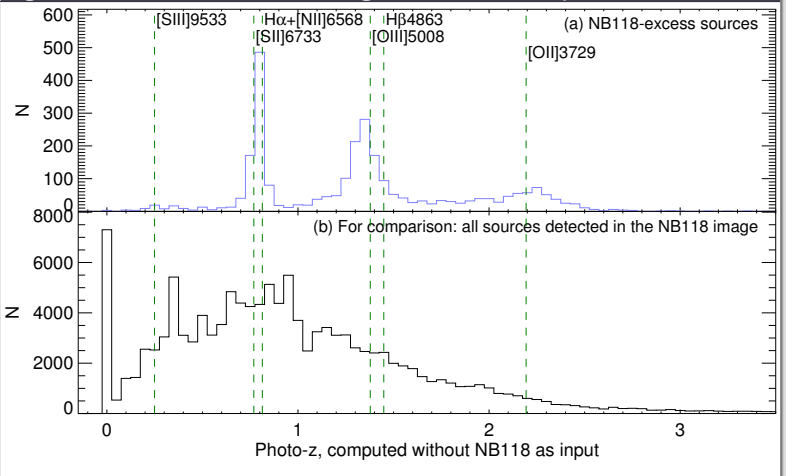


Fig. 6: Photometric redshift histogram, UltraVISTA prelim. DR3 + GTO



The photo-zs were computed by O. Ilbert using a photometric catalogue made by C. Laigle & H. J. McCracken that includes UltraVISTA DR2 YJHKs.
NB118 was *not* used in the photo-z calculation.

TERAPIX

Dark Cosmology Centre, Niels Bohr Institute, University of Copenhagen

Email: milvang@astro.ku.dk