Star Formation Rate of Galaxies at redshifts 0.6-1.2

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Data/Sample

We have used the data from XMM-OM observations of the CDFS and COSMOS fields. The UVW1 (291 nm) filter provides photometry to create source-lists best suited to explore rest-frame 150 nm wavelength in the redshift range 0.6-1.2.

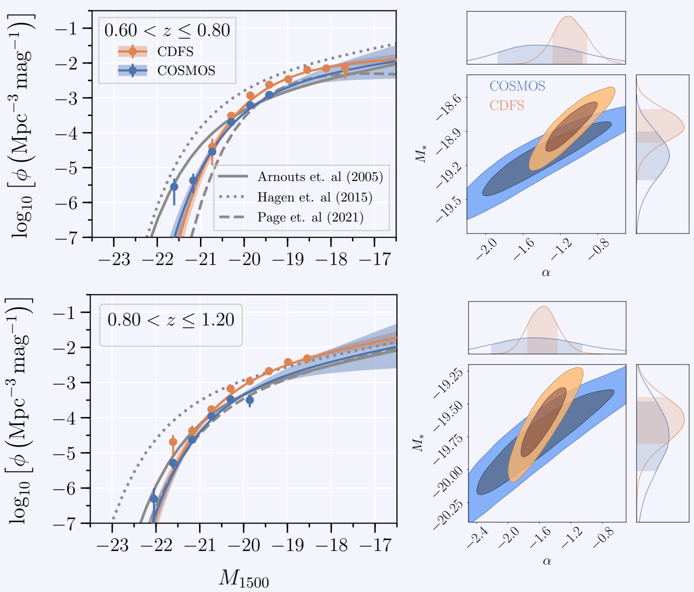


Fig. 1. The binned LF (solid circles) and the maximum likelihood estimated LF (solid lines) for COSMOS (blue) and CDFS (orange) surveys. For comparison LF from other works are in greys.

UV Luminosity function

We use Page-Carerra (Page et. al 2000) method to calculate the binned LF, and maximum likelihood fitting to estimate the parameters of the Schechter function (eq. 1).

The binned LF from COSMOS and CDFS show the difference in the normalisation in the two fields. However, the overall shape seems to be fairly consistent (Fig. 1).

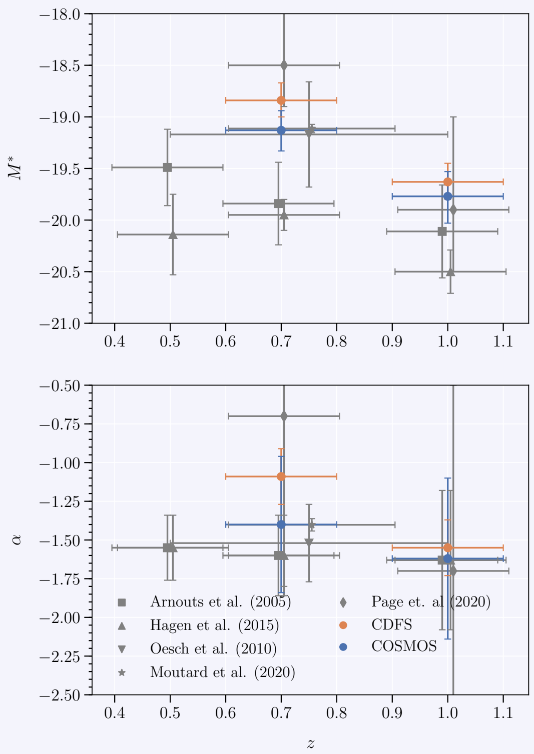
Schechter parameters

$$\phi(M) = k\,\phi^* \frac{e^{k(1+\alpha)(M-M^*)}}{e^{e^{k(M-M^*)}}};\quad k = \frac{2}{5}\ln(10) \qquad (1)$$

For both CDFS and COSMOS the faint end slope is consistent within 1σ of the previous result. We do not observe any significant evolution.

There is a 3σ and 2σ significant change in M^* in CDFS and COSMOS respectively (Fig. 2).

Fig. 2. The Schechter function parameter fits obtained by maximum likelihood fitting. Estimates from previous studies are shown in grey, COSMOS and CDFS results are in blue and orange respectively.



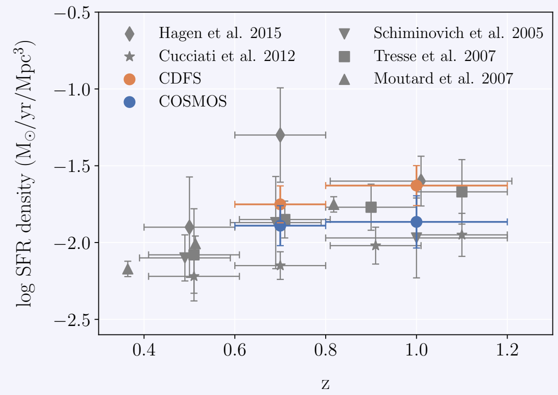


Fig. 3. SFR density as a function of redshift for both CDFS and COSMOS.

Star formation rate (SFR)

The SFR density is calculated using scaling relations from Kennicutt et. al (1998). For both the fields our values are consistent with the previous works (Fig. 3).

Future prospects

Use data from other XMM-OM fields (e.g. HDFN, Lockman Hole) to reduce the effects of cosmic variance.

Extend the work to even lower redshifts using other filter on XMM-OM and Swift UVOT.

References

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