

## 1 Of the surveys' spectroscopic follow-up

1. SNLS's detection efficiency  $\varepsilon \approx 0$  for  $i \approx 24.8$  mag

A limiting magnitude of  $m_{\text{lim}} = 23.5$  mag  $\Rightarrow z_{\text{lim}} = 0.36$ , which would lead to only 26/236 SNe instead of 102/236 with our current cut

2. HST may have a follow-up efficiency that we should take into account like we did for SDSS;
3. Misunderstanding about the 20% of SNf's SNe that had selection effects:

The 80% of SNf's SNe that had no selection effects are the 114 SNe that are in our sample.

## 2 Of the $x_1$ bias that doesn't appear on $m$

The referee insists on the fact that “Biases in  $x_1$  are expected as a function of redshift simply from survey modeling/selection effects”, showing the following figure from KESSLER & SCOLNIC 2017 to point out that biases in  $x_1$  become apparent much sooner than biases on  $m$ .

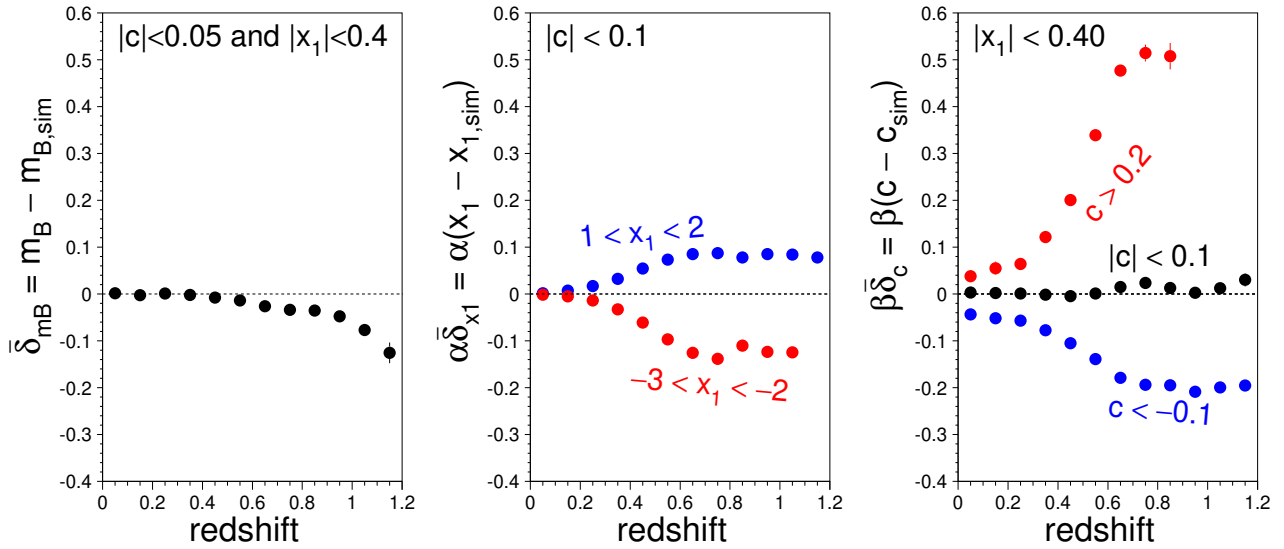


Fig. 1: Bias corrections  $\bar{\delta}_{m_B}$ ,  $\alpha\bar{\delta}_{x_1}$ , and  $\beta\bar{\delta}_c$  are shown as a function of redshift. The pre-factors  $\alpha, \beta$  are used to show the bias in distance-modulus magnitudes. The parameter selection ranges are shown on each panel.

Yet, from the same figure, biases in  $c$  appear at  $z = 0$ . Here we want to convince the referee that if we don't find any sign of color bias in our sample, we may consider little to no bias on  $x_1$ . We thus studied the  $x_1$  and  $c$  distributions of the end of SDSS and the start of PS1, for  $0.10 < z < 0.20$ . In this redshift range, the SDSS cut dataset contains the most questionable SNe Ia, for the SNe between  $0.15 < z < 0.20$  are between our conservative and fiducial cuts, due to limited spectroscopic resources; the PS1 dataset is however quite robust for these SNe are far from both the conservative and fiducial cuts; see Fig. 2.

The results are shown Fig. 3

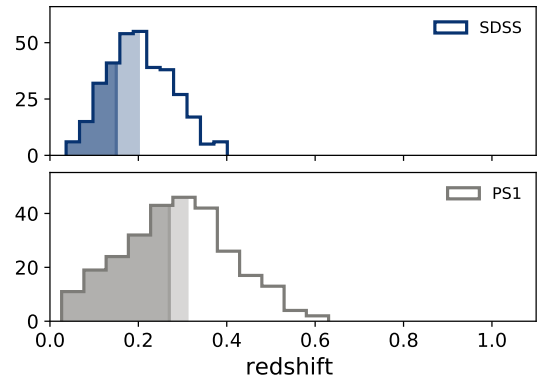


Fig. 2: Redshift histograms of SNe Ia from the SDSS and PS1 datasets respectively

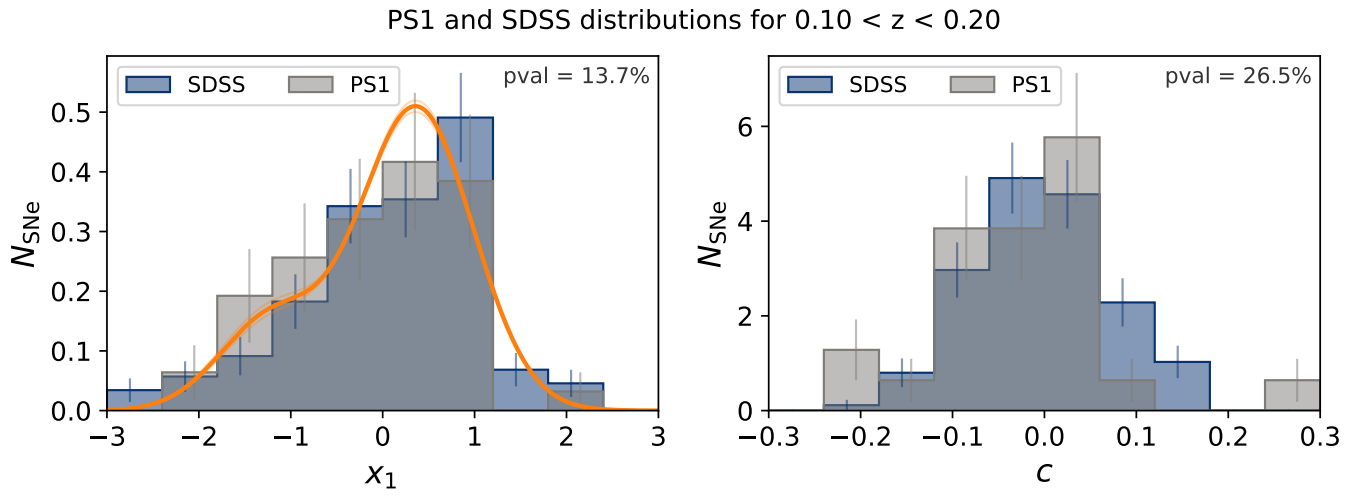


Fig. 3:  $x_1$  and  $c$  distributions of the SDSS and PS1 samples for  $0.10 < z < 0.20$ . A Kolmogorov-Smirnov test doesn't show any indication that the samples are not taken from the same distribution.