Number Counts and Angular Correlation Functions in the FORS DEEP FIELD

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Abstract. The **FORS DEEP FIELD** (FDF, see Appenzeller et al., 2000, ESO-messenger 100, 44) is a project to obtain a deep field with the VLT, combining a large area with an exceptional depth similar to the Hubble Deep Fields. The scientific goal of the FDF is to investigate galaxy evolution in the range $z = 1 - 5$. In this contribution we present results based on the imaging observations in B, R and I. We compare our galaxy number counts with results found in literature and analyze the galaxy clustering by investigating the angular correlation function.

The final, stacked images have a FOV of $6.1' \times 6.1'$ with a very good seeing down to $0.6''$. The source cataloges in the three filters have been created using methods as outlined in Kümmel & Wagner (2000, A&A 353, 867), including corrections for spurious detections and incompleteness. The limiting magnitudes in galaxy number counts are 27.5, 26.75 and 26.25 mag in B, R and I, respectively. At the bright end the number counts agree with the counts derived from large area surveys such as CADIS or EIS. At the faint end our B-counts support the high values from the HDF-South (Volontieri et al., 2000, A&AS 145, 111). In R the faint end slope in the FDF is significantly smaller than those from Hogg et al. (1997, MNRAS 288, 404) and Smail et al. (1995, ApJ 449, L105). To measure the two point correlation function we used the estimator introduced by Landy & Szalay (1993, ApJ 412, 64). We restricted the galaxy sample to objects with $B < 27.0$, $R < 26.25$ and $I < 25.75$ mag in order to avoid contamination from spurious objects or selection effects caused by incompleteness. The clustering amplitudes (with $\delta = -0.8$) are $7.3 \times 10^{-6} \pm 7.1 \times 10^{-5}$, $4.7 \times 10^{-5} \pm 7.0 \times 10^{-5}$ and $4.8 \times 10^{-5} \pm 7.5 \times 10^{-5}$ in B, R and I, respectively. Because of the large error only upper limits can be given for the amplitudes. The $3\,\sigma$-upper limits of 2.1×10^{-4}, 2.6×10^{-4} and 2.7×10^{-4}, are just in agreement with the amplitudes measured in McCracken et al. (2000, MNRAS 318, 913) to the same depths. However, the FDF-limit in I is by far smaller than the values measured by Brainerd & Smail (1998, ApJ 494, L137). The differing results and the small correlations found in the FDF emphasize the need for larger object samples at those faint magnitudes to derive the correlation amplitude at ~ 27 mag.