An input stellar population old (AGE=10-12 Gyr) and with a wide metallicity distribution is used to produce synthetic images adopting the MAORY PSF with the Advanced Exposure Time Calculator (AETC, Uslenghi & Falomo 2010) at URL: aetc.oapd.inaf.it

The population is placed at different surface brightness levels, (i.e. different crowding conditions) by scaling 4 parent simulations of different sizes.

Photometry on the synthetic images is performed with STARFINDER

The imaging capabilities currently foreseen for the E-ELT will allow us to perform accurate stellar photometry in crowded fields. Among the many interesting applications it will be possible to derive the metallicity distribution of stars in high surface brightness regions of galaxies from the color distribution of Red Giant Branch stars (Greggio et al 2012). We show here the results of end-to-end simulations at various locations within a giant Elliptical galaxy in the Virgo Cluster. We use a distance modulus of 31.3, an exposure time of 2 hrs, and the expected performance of MICADO @ E-ELT.

For each object on the output CMD, [Fe/H] is derived by interpolation on theoretical loci. For the case A2 the accurate (r.m.s.) of the distribution of [Fe/H] of individual stars. The figure below shows how this quantity varies with magnitude for the various SB and PSF considered.

How well can we determine the metallicity of individual stars?

For each object on the output CMD, [Fe/H] is derived by interpolation on theoretical loci. We consider only stars in the portion of the RGB in boldface

References:
Falomo, R., Fantinel, D., Uslenghi, M., 2011, SPIE, 8135, 813523