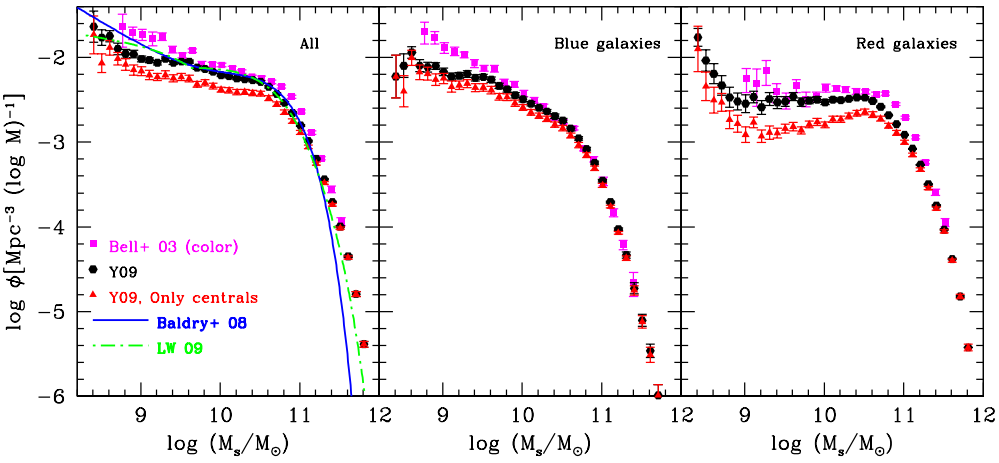

Fig. 1. Left panel: Different local *GSMF*s for *all* galaxies. The reported data in Bell et al. (2003, pink squares) and YMB09 (black hexagons) are plotted directly, while for Baldry et al. (2008, blue solid line) and Li & White (2009, dot-dashed green line), the best fits these authors find to their samples are plotted. Red triangles show the data from YMB09 corresponding to the *GSMF* of central-only galaxies. Middle and right panels: Data corresponding to the decomposition of the *GSMF* into blue and red galaxies, respectively, from Bell et al. (2003) and for the all and central-only galaxies from YMB09. The color figure can be viewed online.

in infrared bands. Conroy, Gunn, & White (2009) carried out a deep analysis of propagation of uncertainties in SPS modelling and concluded that $M_{\rm s}$ at $z \sim 0$ carry errors up to ∼0.3 dex (but see Gallazzi & Bell 2009). Here, we will consider an overall systematic uncertainty of 0.25 dex in the $M_{\rm s}$ determination (see BCW10).

Most of the current local *GSMF*s were inferred from 2dF Galaxy Redshift Survey, Two Micron All-Sky Survey (2MASS) and SDSS (e.g., Cole et al. 2001; Bell et al. 2003; Baldry et al. 2006). The low-mass completeness limit due to missing low surface brightness galaxies occurs at $\sim 10^{8.5}$ $M_{\rm s}$ (Baldry et al. 2008). An upturn of the *GSMF* close to this end (below $M_{\rm s} \sim 10^{9}$ $M_{\odot}$) was confirmed in several recent works (Baldry et al. 2008; YMB09; Li & White 2009). Due to this upturn, a better fit to the *GSMF*s is obtained by using a double or even triple Schechter function. Since the low-mass end of the *GSMF* is dominated by late-type galaxies, this upturn plays an important role in the $M_{\rm s}$–$M_{\rm h}$ relation of late-type galaxies at low masses.

For our purposes, observational works where the *GSMF* is decomposed into late- and early-types galaxies are required. Such a decomposition has been done, for example, in Bell et al. (2003), who combined 22679 SDSS Early Data Release and 2MASS galaxies, and used two different criteria, color and concentration, to split the sample into two types of galaxies. A much larger sample taken from the NYU-VAGC based on the SDSS DR4 has been used by YMB09 (see also Yang, Mo, & van den Bosch 2008), who split the sample into *blue and red* subsamples according to a criterion in the ${}^{0.1}(g-r)-M_r$ diagram. In both works, $M_{\rm s}$ is calculated from the $r-$band magnitude by using the corresponding color-dependent $M_{\rm s}/L_r$ ratio given in Bell et al. (2003). In YMB09 each color subsample is in turn separated into central and satellite galaxies according to their memberships in the constructed groups, where the central galaxy is defined as the most massive one in the group and the rest as satellite galaxies.

In Figure 1, the Bell et al. (2003) and YMB09 *GSMF*s are reproduced by using the data sets reported in these papers. In the left panel, the full samples from each work (solid squares and solid hexagons, respectively) are plotted, as well as the case of central-only galaxies from YMB09 (solid triangles); both *GSMF*s and the other ones plotted in this figure are normalised to $h = 0.7$ and to a Chabrier (2003) IMF. In the central and right panels, the corresponding blue (late-type) and red (early-type) sub-samples are plotted with the same symbols as in the left panel. For the Bell et al. (2003) sub-samples, only those separated by their color criterion are plotted. Both *GSMF*s corresponding to the full and blue sub-samples are in good agreement for $M_{\rm s} \gtrsim 10^{9.5}$ $M_{\odot}$. For lower masses, the Bell et al. (2003) *GSMF*'s are higher. On one hand, the Bell et al. (2003) sample is much smaller than the