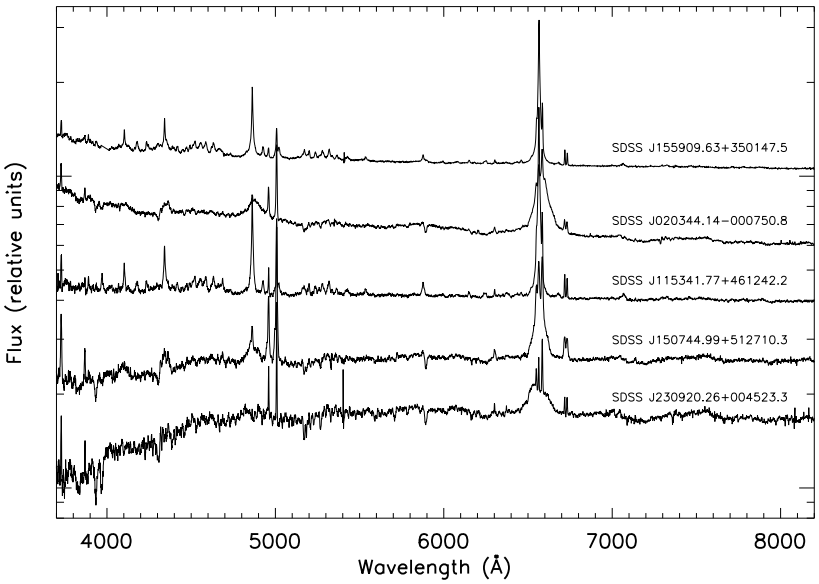

Fig. 1. Spectra of the broad line AGNs of our original sample of 2MIG galaxies. The flux scale is relative and was slightly displaced for clarity.

of these galaxies are presented in Figure 1. These galaxies were also discarded from our analysis.

We classified the 409 remaining galaxies as isolated Narrow Emission Lines Galaxies (NELGs). The spectra of these galaxies were subsequently corrected for Galactic extinction (Schlegel, Finkbeiner, & Davis 1998), shifted to their rest frame, resampled to $\Delta\lambda$=1 Å between 3400 and 8900 Å, and processed using the spectral synthesis code STARLIGHT (Cid Fernandes et al. 2005), which produces a stellar population template that fits the continuum of each galaxy. We ran STARLIGHT using a combination of $N_\star$ Simple Stellar Populations (SSPs) from the evolutionary synthesis models of Bruzual & Charlot (2003). The models were computed with the MILES library (Vazdekis et al. 2010), following Padova's evolutionary tracks with the initial mass function of Chabrier (2003). An SSP consists of $N_\star = 150$ elements, spanning six metallicities, $Z = 0.005$, 0.02, 0.2, 0.4, 1 and 2.5 $Z_\odot$, and 25 stellar population ages in the range from 1 Myr to 18 Gyr.

In the template-subtracted spectra, we measured automatically different important attributes of the spectral emission lines, like their flux and full width at half maximum (FWHM). Other important features retrieved from the stellar population templates fitted by STARLIGHT are the stellar velocity dispersions and the star formation history (SFH) of the host galaxies. The SFH map shows how the smoothed star formation rate (SFR) in a galaxy varies over a time period covering $\log(t) = 5.7$ yr to $\log(t) = 10.6$ yr (Asari et al. 2007).

2.1. *Morphologies and star formation history*

To determine the morphologies of the galaxies we used a composite method combining an eye estimate with the SFH. First, two of us (IP-F and RC) determined by eye the morphologies of the 409 isolated NELGs following the standard Hubble classification. Then, using only the galaxies with concordant morphologies–meaning the two observers gave exactly the same morphology–an average SFH prototype for each morphology class was created. Using these prototypes, the residuals of the SFH for each galaxy were calculated separately in three distinct time periods: Recent, $5.7 \leq \log(t/\mathrm{yr}) \leq 7.9$, Intermediate, $7.9 < \log(t/\mathrm{yr}) \leq 9.0$, and Old, $9.0 < \log(t/\mathrm{yr}) \leq 10.6$. A correction was then made to the eye morphology classification by choosing a morphology that minimized the variance of the residuals in each time period. For example, by eye we could have given the type S0 or Sa to a galaxy, but the residuals being minimal for Sa we adopted this last classification.

Once the morphologies were correctly adjusted to the SFH, we recalculated the prototypes by calculating the mean SFH in each morphological bin. Since we found the Sb and Sbc types to have SFH prototypes that are extremely similar and almost impossible to distinguish, we merged these two morphological bins together, keeping only the Sb identifi-