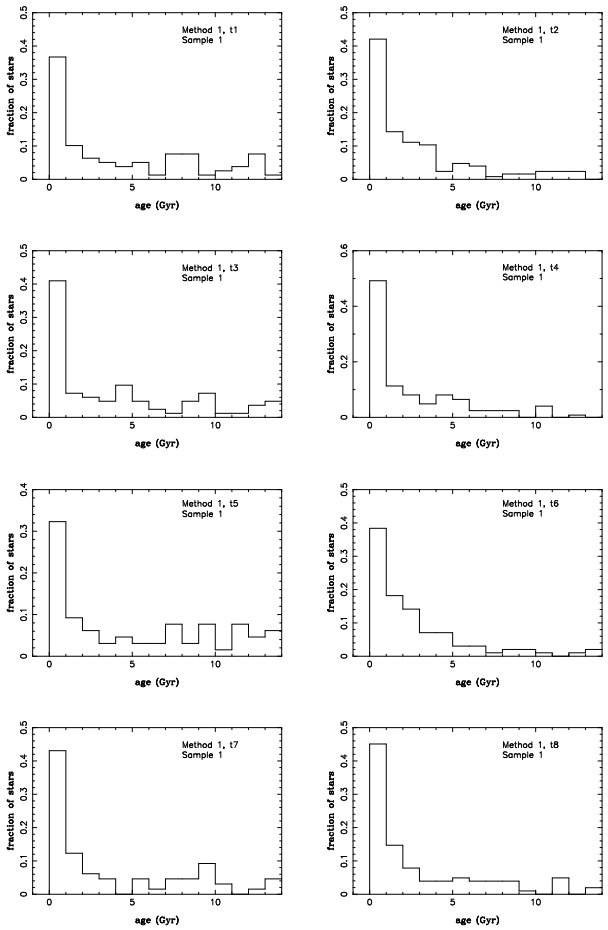


Fig. 1. Age distribution of CSPN, Method 1, Sample 1.

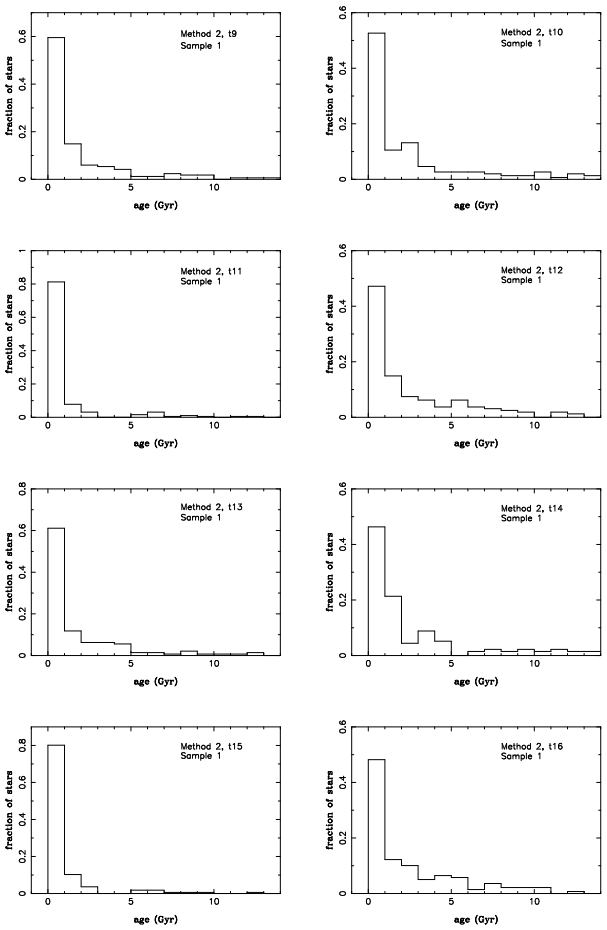


Fig. 2. Age distribution of CSPN, Method 2, Sample 1.

The similarity of the results of both methods is remarkable, especially considering that Method 2 is probably more accurate than Method 1. Method 2 consists of straightforward calculations of the velocities and velocity dispersions followed by an application of relatively accurate correlations involving the kinematics and ages of the objects considered. On the other hand, Method 1 is based on the assumption that the differences between the observed and predicted rotation velocities are essentially due to age effects. However, other processes may be important, such as deviations from the circular rotation, which is particularly important for nearby objects. According to Table 5, in all cases the vast majority of CSPN have ages under 3 Gyr. For Method 1 the total fraction of objects with $t \leq 3$ Gyr is 50–70%, while for Method 2 this fraction is somewhat higher, 70–90%. It is unlikely that this is a result from bias in the samples, as the results for the larger Sample 2 are essentially the same as in the smaller Sample 1. It should be pointed out that the latter, albeit smaller, includes only well studied nebulae, for which all individual parameters (distances, velocities, abundances) are better determined.

Also, there are no significant differences in the results using the different velocity components $U$, $V$, $W$, and $T$. For Method 1, the distributions using the $V$ velocity component are essentially the same as those using the total velocity, for both distance scales and samples. For Method 2, the distributions are slightly more concentrated in the first few age bins for the $W$ component, compared with the distributions for the $U$ and $V$ components and the total velocity, again for both distance scales and samples. Since the $W$ component is more clearly associated with the disk heating, essentially caused by age effects, the corresponding distributions are probably more accurate.

Similar remarks can be made regarding the adopted values for the proper motions. As mentioned at the end of § 2, the results shown here assume that $\mu_\alpha \simeq \mu_\delta \simeq 0$. Adopting nonzero values