CONSTRAINTS ON INTERACTIONS AND MERGERS FROM DSPH GALAXIES AND GLOBULAR CLUSTERS

E.K. GREBEL
Astron. Institut, Univ. Würzburg, Germany
Lick Observatory, UC Santa Cruz, USA

Observations at high redshifts are revealing numerous interactions and ongoing mergers. Our own Milky Way is currently merging with the Sagittarius dwarf spheroidal (dSph) galaxy. Past mergers with dwarf galaxies may have contributed significantly to the Galactic halo and possibly to the thick disk. The properties of Local Group dSphs and halo globular clusters impose constraints on the merger history of the Milky Way.

The apparent alignment of dwarf satellites of the Milky Way and 'young' halo globular clusters along two polar great circles suggests streams of dwarf satellites that are gradually accreted and contribute the 'young' globulars (Majewski 1994, *ApJ*, **431**, L17). However, Sagittarius contributes both intermediate-age and old globulars. Absolute space motions for 30 Galactic globular clusters imply that several 'young' globulars are not associated with the proposed streams. Moreover we find clusters on prograde and retrograde orbits to cover similar age ranges and metallicities.

The large differences in star formation histories and metallicity (Grebel 1997, *Reviews in Modern Astronomy*, **10**, 29) seem to contradict that dSphs are remnants of two massive galaxies that merged with the Milky Way (Gerola et al. 1983, *ApJ*, **268**, L75).

Absolute space motions are lacking for most dwarf galaxies, but the direction of motion is also indicated by tidal tails if galaxies suffer tidal interactions. Extra-tidal stars were detected around all Milky Way dSphs (Irwin & Hatzidimitriou 1995, *MNRAS*, **277**, 1354). We show that the position angles of most dSphs (exception: Leo II) are aligned with the proposed great circles.

We find that Andromeda's satellites all seem aligned along a single polar great circle. Dwarf galaxies observed at the present epoch may preferably constitute galaxies on stable polar orbits – survivors of a previously much more numerous dwarf galaxy population.

https://doi.org/10.1017/S0074180900112197 Published online by Cambridge University Press