Variable Stars in the Sextans Dwarf Spheroidal Galaxy
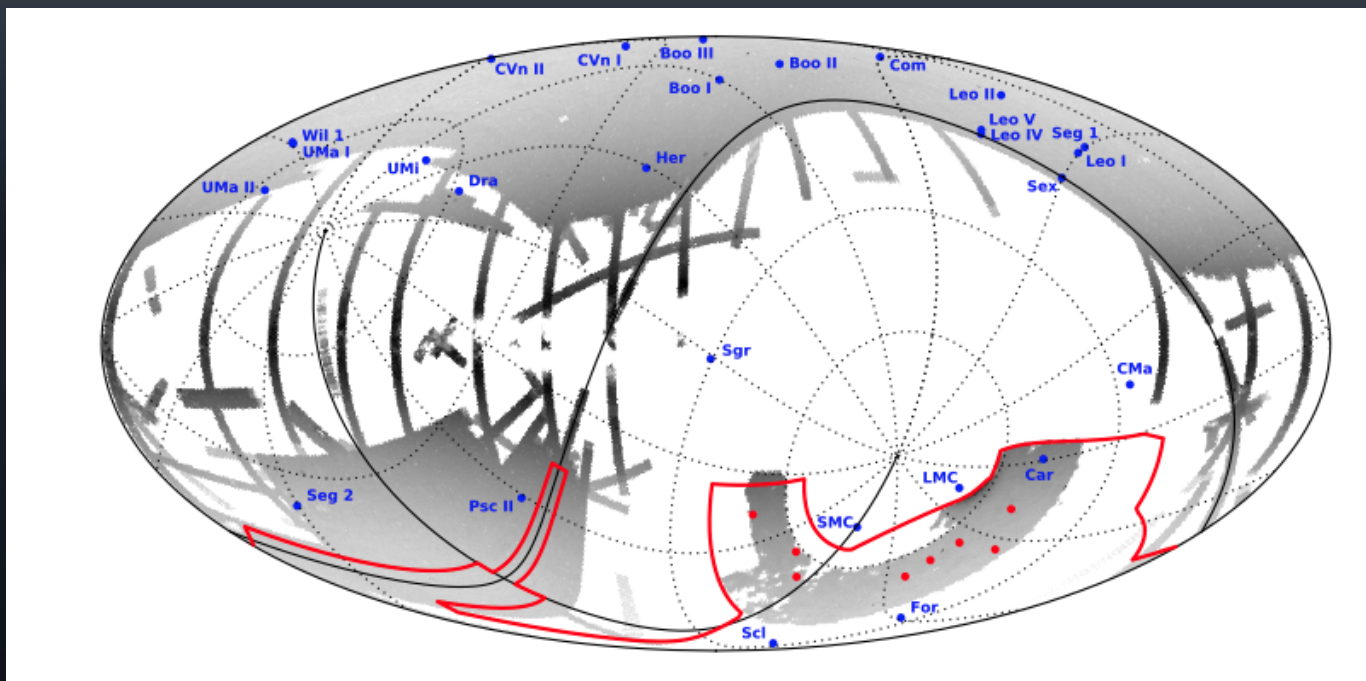## … *a progress report*

Kathy Vivas
Cerro Tololo Interamerican Observatory
La Serena, Chile

Collaborators: M. Mateo (Michigan), J. Alonso-García (PUC, Chile), A. Walker (CTIO), D. Nidever (Michigan), B. Howard (CTIO REU student)
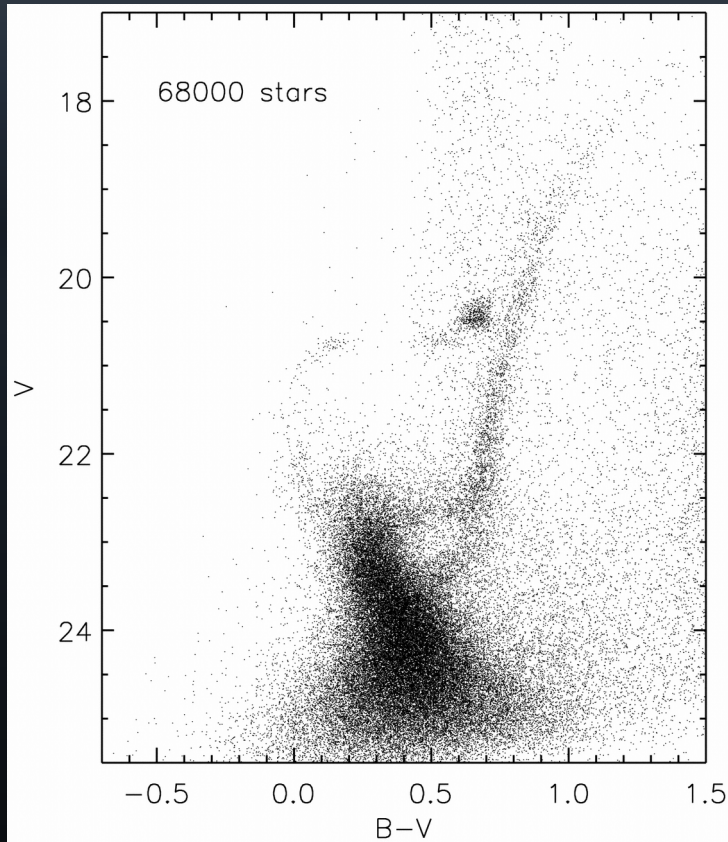
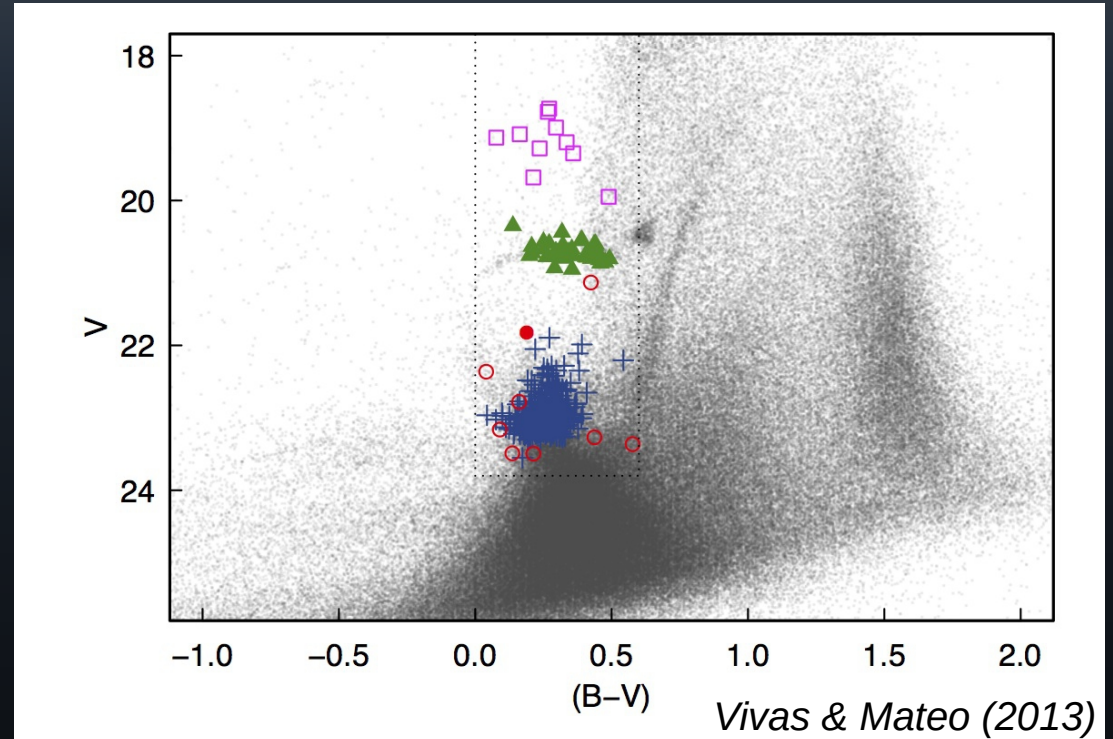# Dwarf Galaxies and their Variables

Updated map of MW satellites (DES Collaboration, 2015)

- Milky Way satellites allow studying the process of galaxy assembly

- SFH are different in many of these galaxies. Why?
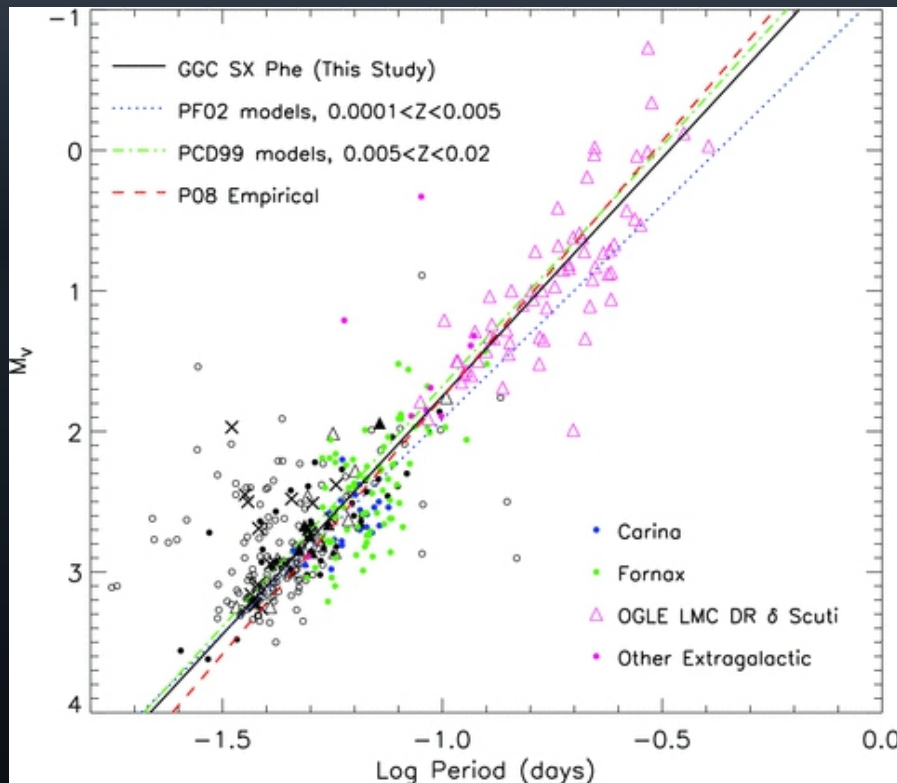
The Role of Variable Stars
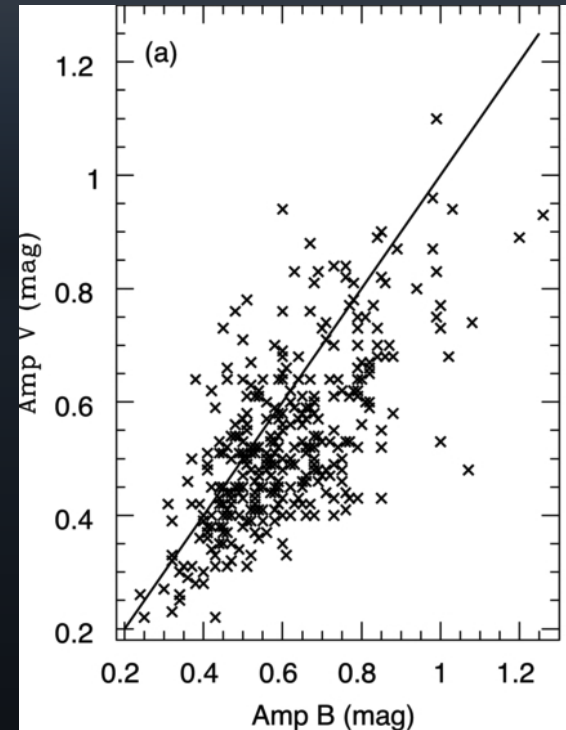

Carina dSph CMD (Monelli et al 2003)

Vivas & Mateo (2013)

- Anomalous Cepheids

- RR Lyrae Stars

- Dwarf Cepheids

The Importance of Dwarf Cepheids

Cohen et al (2012)

*Amplitudes of dwarf cepheids in Carina,
Vivas & Mateo (2013)*

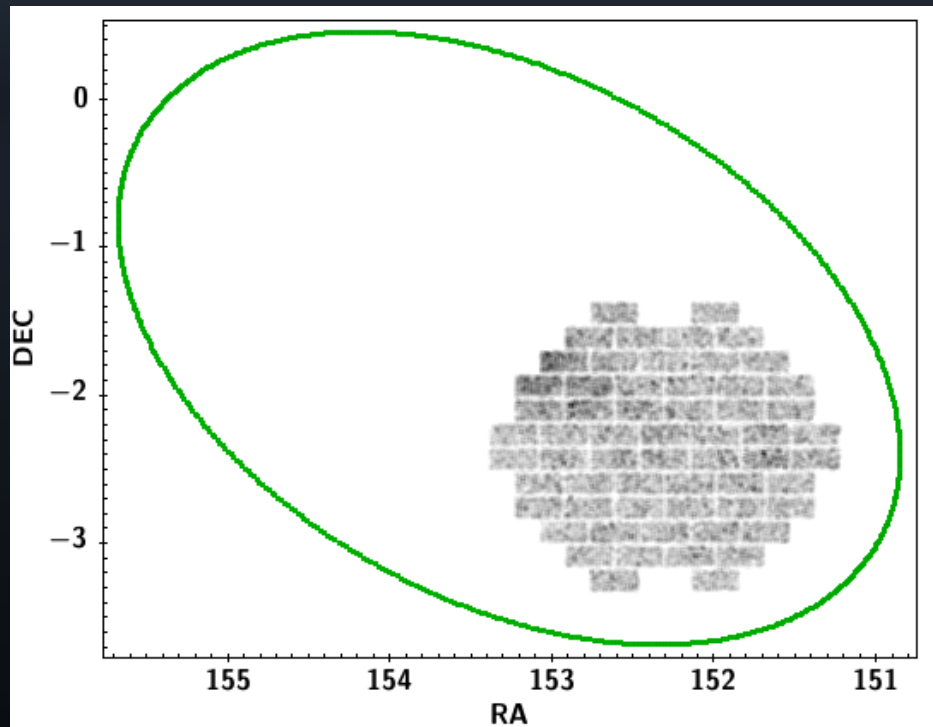P-L relationship → standard candles

Only 1 DC (out of 1600) in Kepler field
has Amp > 0.1 mag

Observing Dwarf Cepheids

- Observational Challenges:

  - Faint

  - Short periods (~1 hour)

- Only 3 external galaxies have been searched for dwarf cepheids

# The Sextans Dwarf Spheroidal Galaxy

- ~100 kpc

- Mostly old stars but also, intermediate age population

- Large galaxy, low surface brightness

- 2 DECam fields within the tidal radius

- Time series in g and r (~30 epochs/band, with a cadence of ~10 minutes)
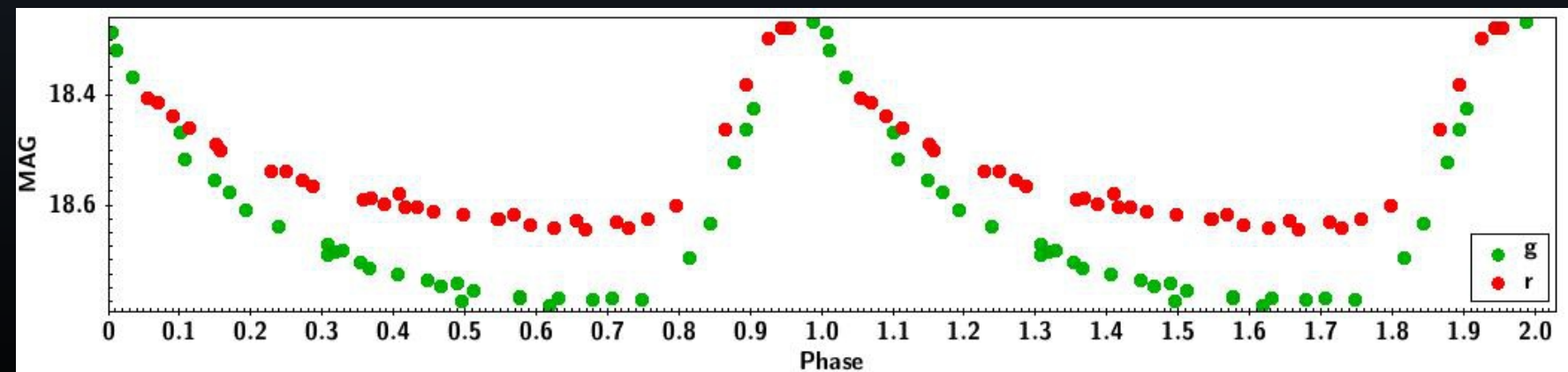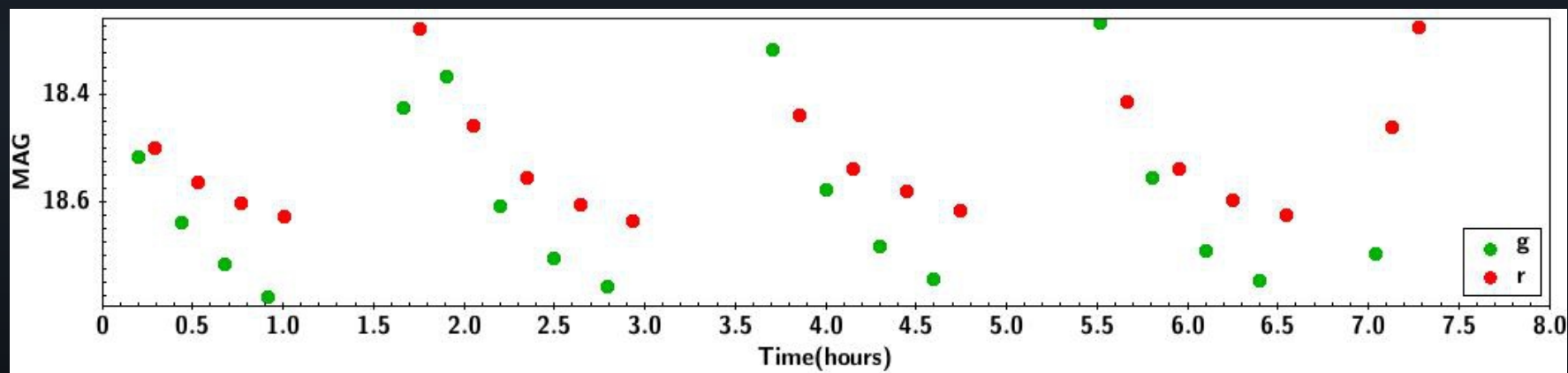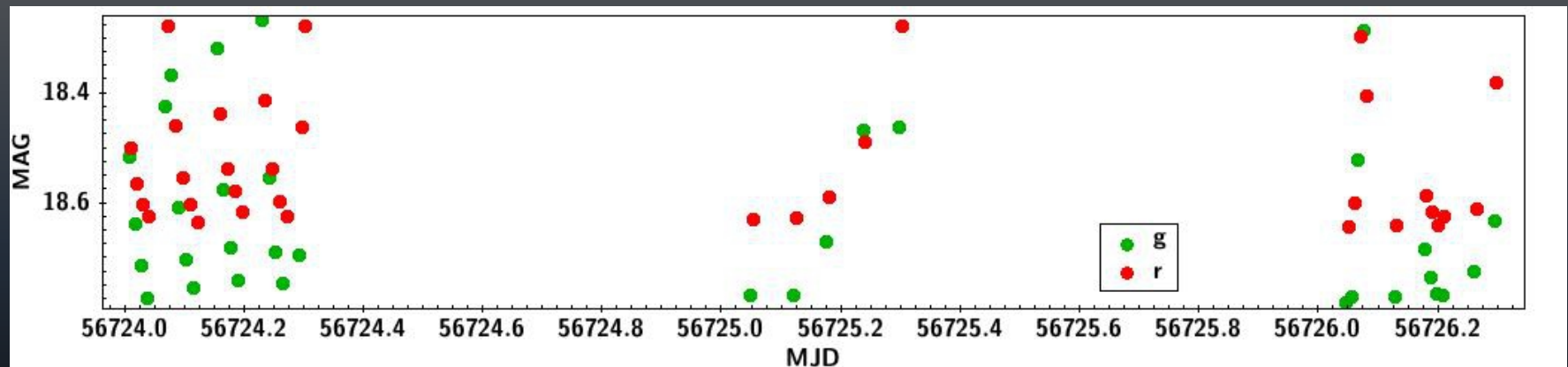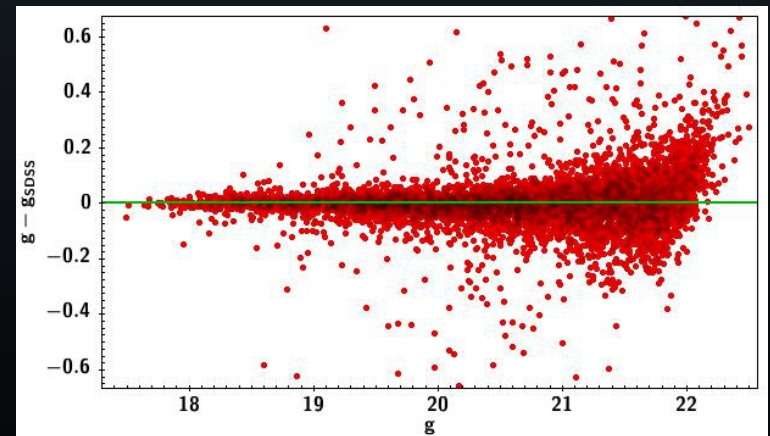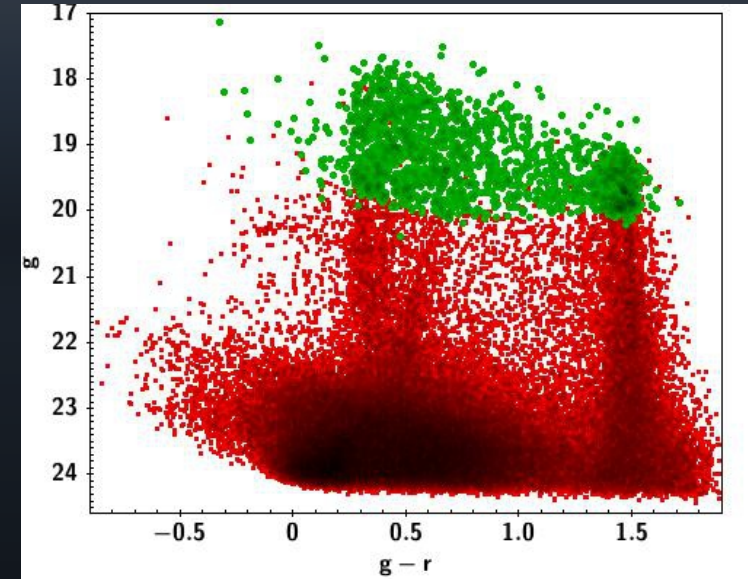
DECam Community Science Workshop

Procedure

- Community Pipeline

- DoPhot photometry on individual images

- Cleaning

- Matching catalogs by coordinates

- Relative photometry

- Calibration
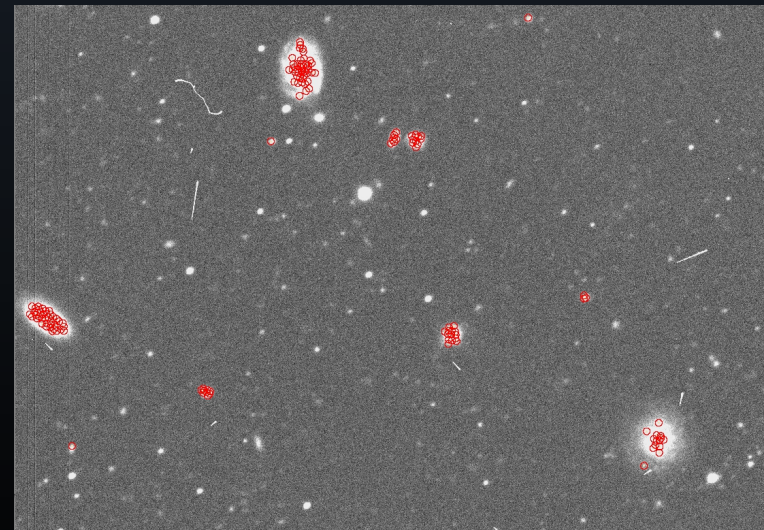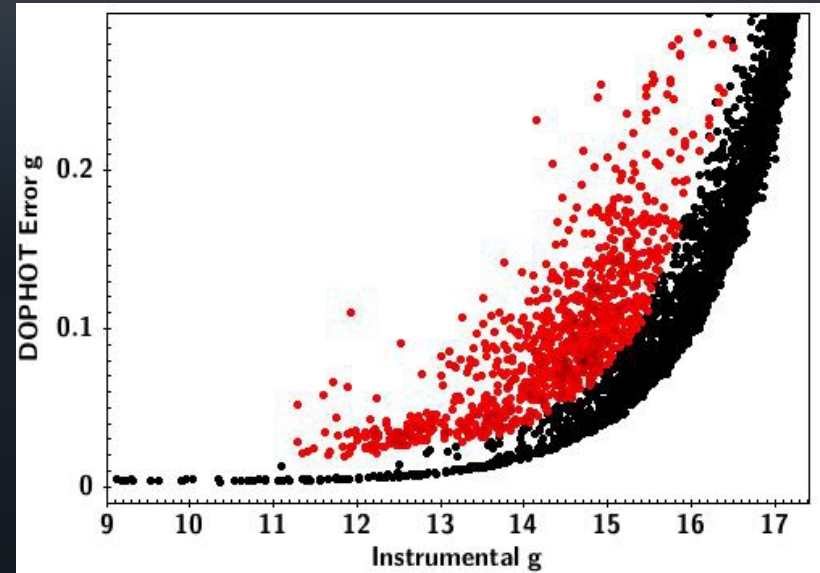
- Variables

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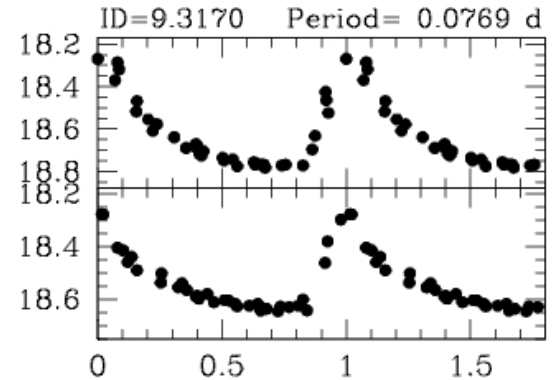
- Relative photometry

- Calibration
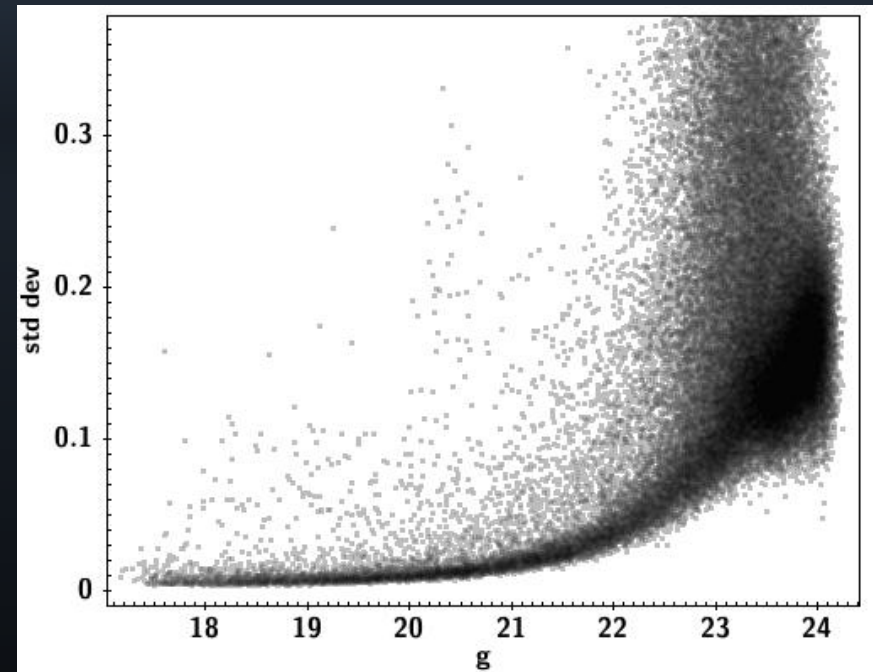
- Variables
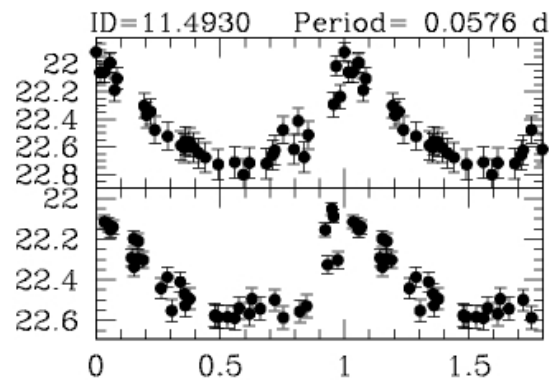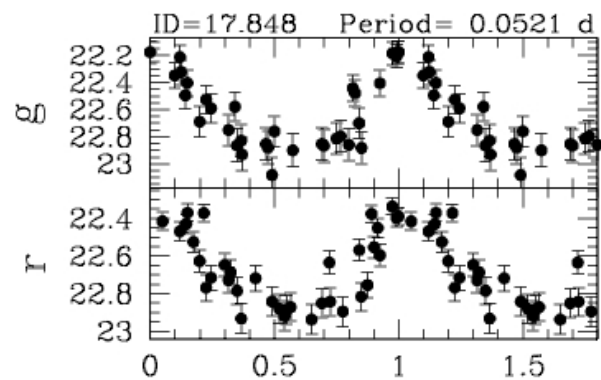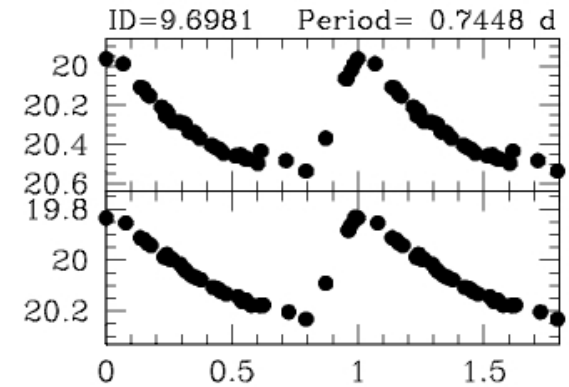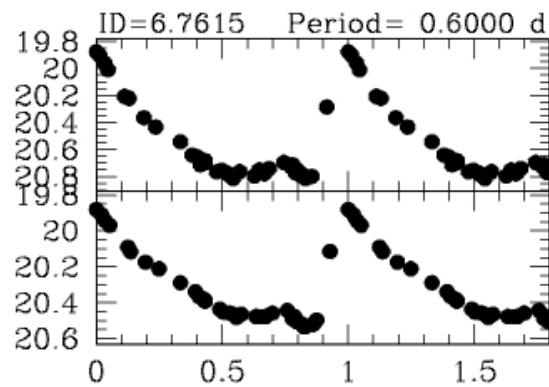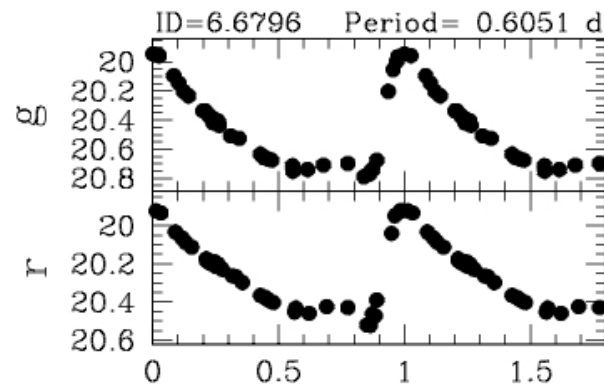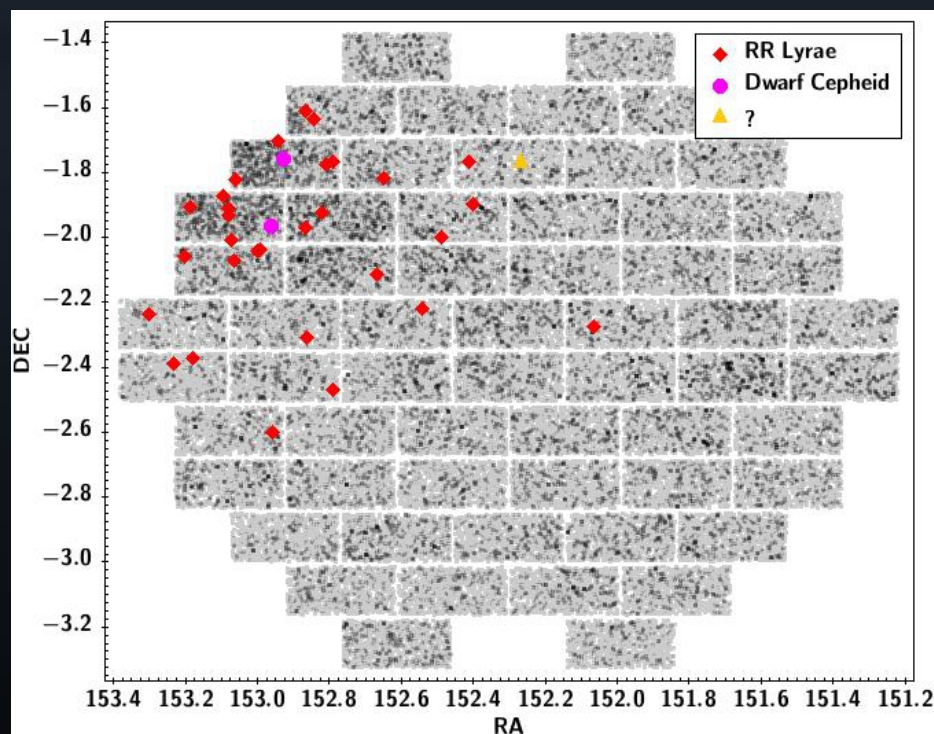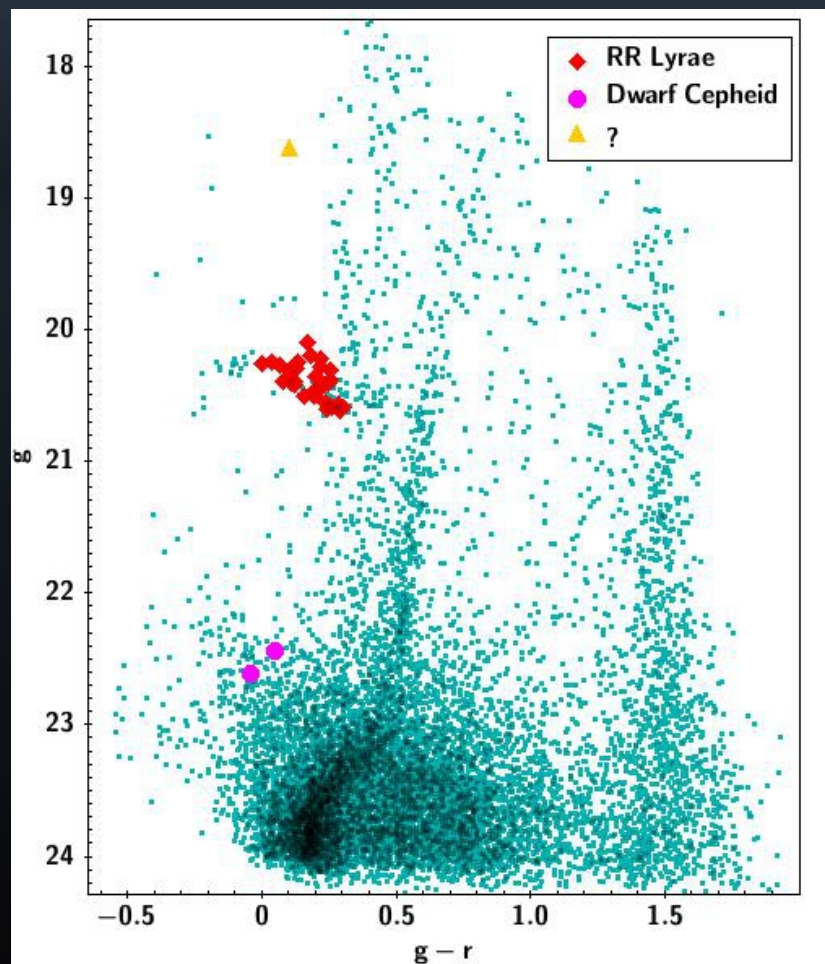
Period Finding

Method based on Lafler and Kinman (1965) but using the 2-bands simultaneously
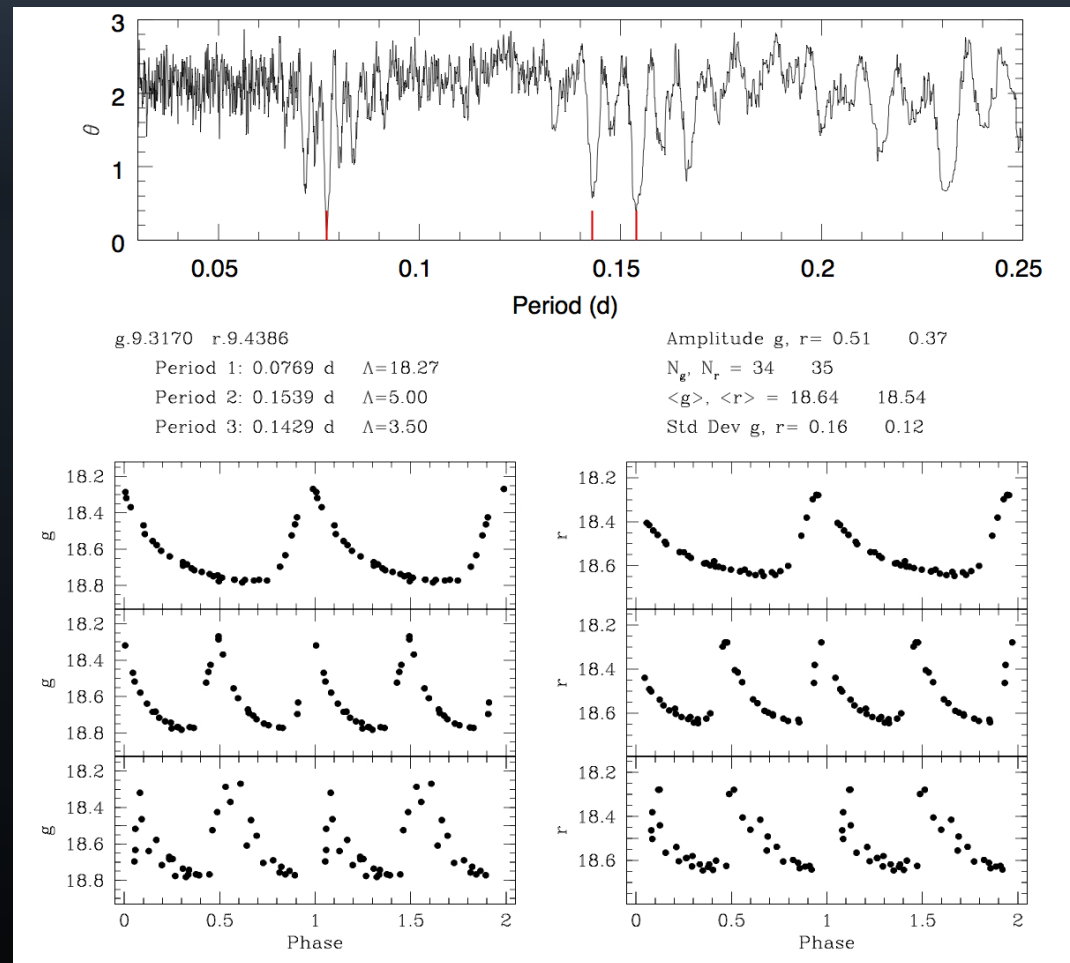
New Variables

Location of the variables in the CMD and in the sky

Summary and Future Work

- We have succesfully put together a pipeline to identify short period variable stars

- So far, 33 RR Lyrae stars and 2 dwarf cepheids

- Sgr dwarf is next

- Study extension of the different stellar populations in these galaxies

- Deep CMDs over the whole area