The Open Clusters Chemical Abundances from Spanish Observatories (OCCASO) Survey

The OCCASO team

arXiv:1412.3509

Motivation

Open Clusters (OCs) are key tracers to investigate the Galactic disk.
Main targets in space missions (Gaia,Kepler) and ground-based surveys (GES,APOGEE, GALAH).

Parallaxes: 25 μas @V=15.
Proper motions,tangential velocities.
Radial velocities: 15 Km s^{-1} @ V~15
Abudances: V<11.5

Variability: precision 80 ppm.

South
Abundances and radial velocities.
20-30 OCs with age >0.5 Gyr

North (& South)
Abundances and radial velocities.
25 OCs with age >0.5 Gyr
(only 7 OCs with ≥6 stars observed)

South
Abundances and radial velocities.
TBD OCs with age >0.5 Gyr

North not properly covered!!

Observations

HERMES@Mercator (1.2 m)
R~85000; 3770-9000 Å; V<12.5

FIES@NOT (2.5 m)
R~67000; 3700-7300 Å; 13.5<V<15

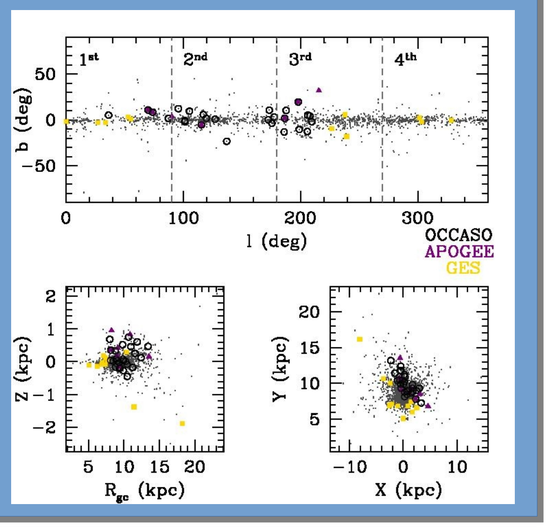
CAFE@CAHA 2.2 m
R~60000; 3960-9500 Å; 13<V<14

Awarded	25	25	15
Observed	20	20	13
Time Lost	30%	17%	50%

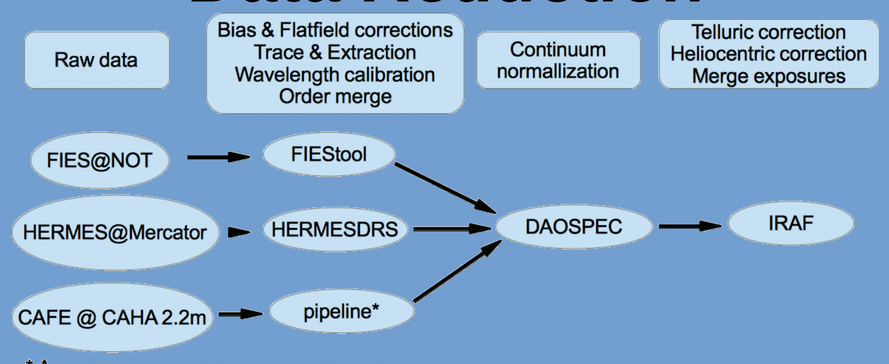
Cluster Selection

Cluster	Rgc (kpc)	Age (Gyr)	Z (kpc)	Observed stars
NGC 6705	6.9	0.2	+0.09	7
NGC 6633	7.7	0.6	+0.05	4
NGC 6791	8.0	7.9	+0.68	6
IC 4756	8.1	0.8	+0.04	6
NGC6819	8.2	2.9	+0.36	6
NGC 6991	8.5	1.3	+0.02	6
NGC 752	8.8	1.6	-0.16	7
NGC 6939	8.8	1.3	+0.33	4
NGC 7762	8.9	2.0	+0.08	6
King 1	9.1	4.0	+0.03	4
NGC 2682	9.2	4.2	+0.48	6
NGC 188	9.2	4.3	+0.79	4
NGC 2539	9.4	0.4	+0.27	6
NGC 7789	9.5	1.6	-0.18	7
NGC 7142	9.8	4.1	+0.52	1
NGC 2099	9.9	0.4	+0.07	7
NGC 559	10.0	2.0	+0.03	1
NGC 1907	10.2	0.4	+0.01	6
NGC 1817	10.5	0.4	-0.45	5
NGC 2420	10.7	2.9	+0.75	5
Berkeley 17	11.2	1.0	-0.17	2

Criteria:
- Older than 0.4 Gyr.
- Large range age, Rgc, z.
- ≥6 stars on the red clump.

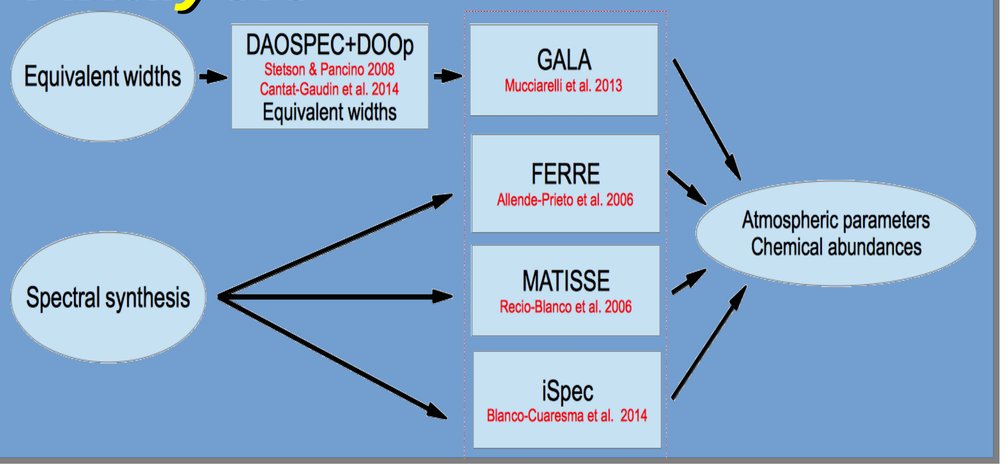


Data Reduction

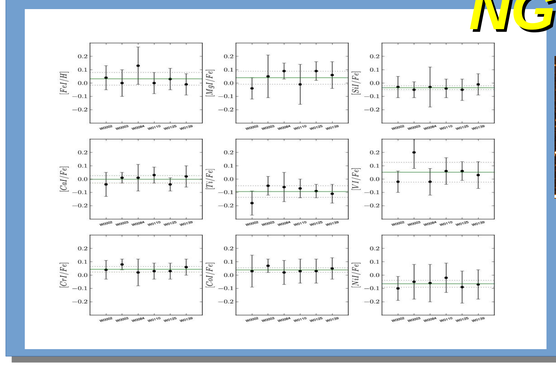


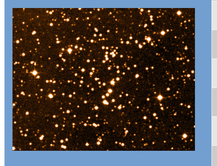
* Adapted from the pipeline kindly provided by J. Maiz-Apellaniz

Analysis



Example of Results: NGC 7762

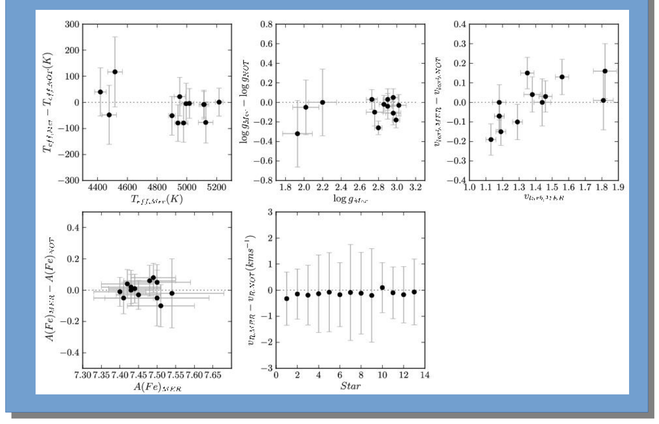




[Fe/H]	+0.03±0.05
[Mg/Fe]	+0.04±0.05
[Si/Fe]	-0.04±0.01
[Ca/Fe]	+0.00±0.03
[Sc/Fe]	+0.11±0.07
[Ti/Fe]	-0.09±0.04
[V/Fe]	+0.05±0.07
[Cr/Fe]	+0.04±0.02
[Co/Fe]	+0.04±0.02
[Ni/Fe]	-0.07±0.03
[Y/Fe]	+0.04±0.09
[Ba/Fe]	+0.20±0.05
[La/Fe]	+0.13±0.18
[Eu/Fe]	+0.30±0.10

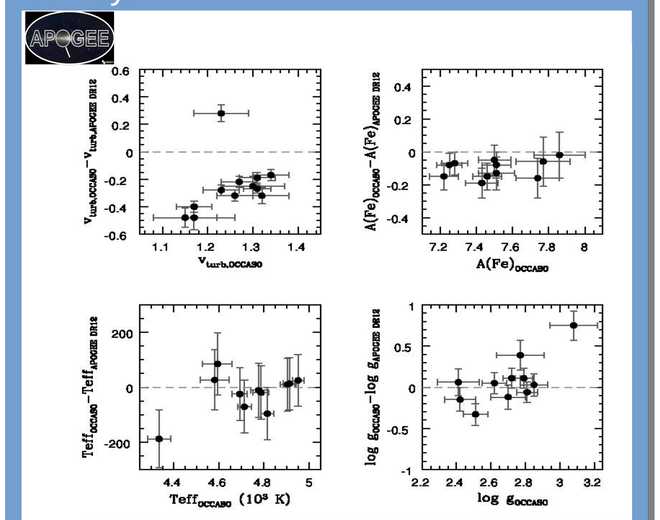
Consistency

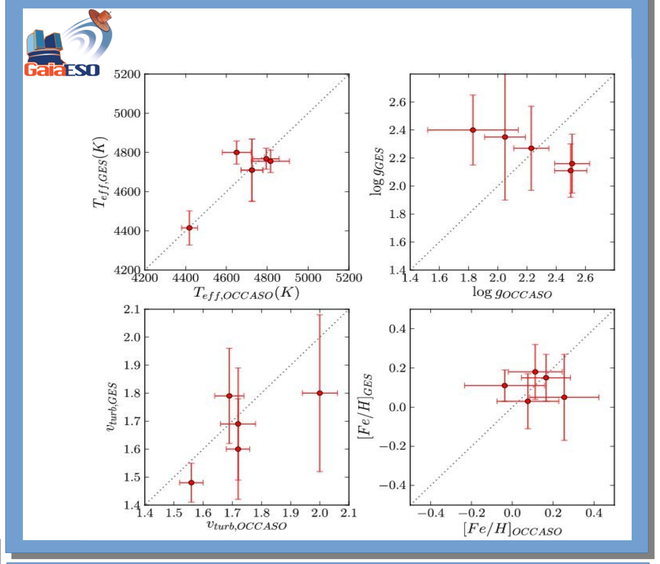
Stars observed in common with both Mercator and NOT telescopes.



External Comparison

Stars observed in common with other surveys.





WEAVE & OCCASO

WEAVE will expand OCCASO by observing:
- more distant clusters (enlarging the Rgc range)
- more stars in each cluster (red clump, turn-off, main sequence).

OCCASO will support WEAVE by:
- providing abundances from higher resolution.

OCCASO team

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