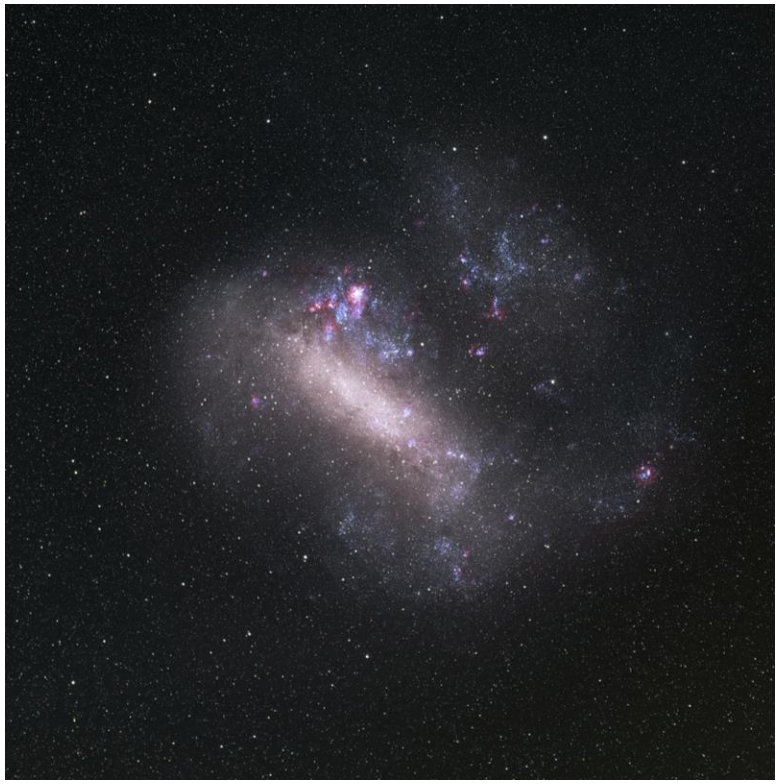
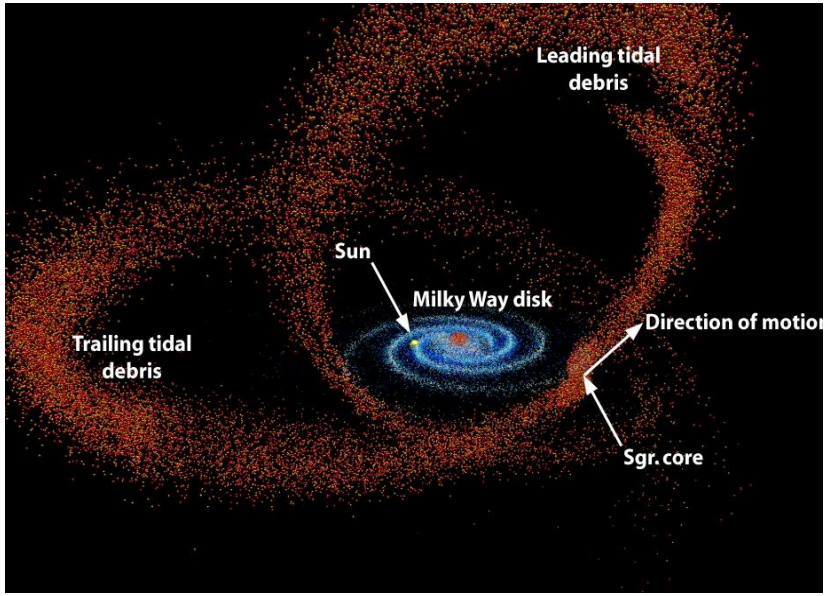
A spectroscopic high-resolution comparison between LMC and Sagittarius dwarf galaxy

Alice Minelli - Department of Physics and Astronomy, Bologna University
Collaborators: A. Mucciarelli, F. R. Ferraro, L. Origlia





A synoptic view of the Magellanic Clouds: VMC, Gaia and beyond

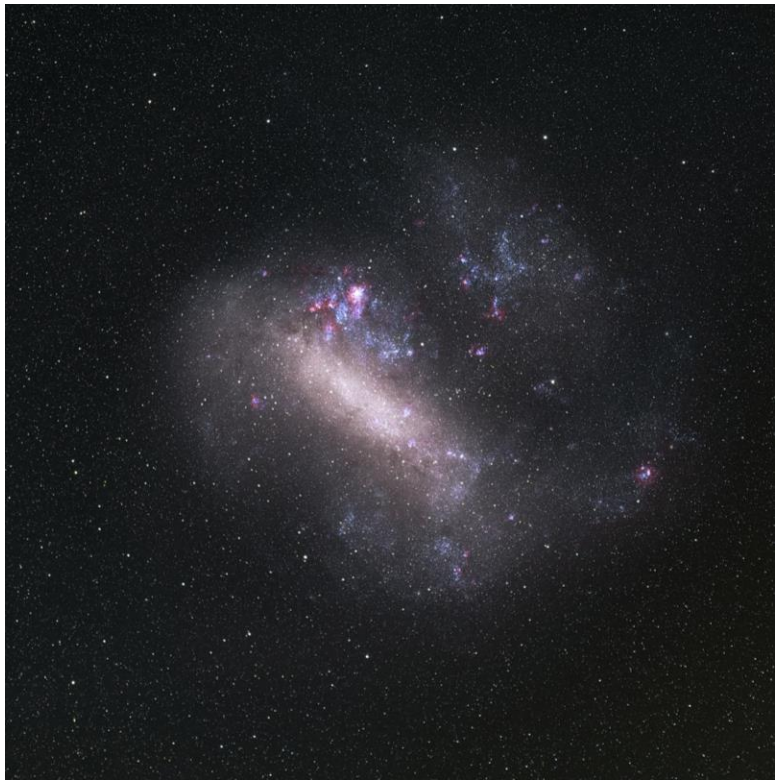
9th September 2019

comparison

NO isolated systems

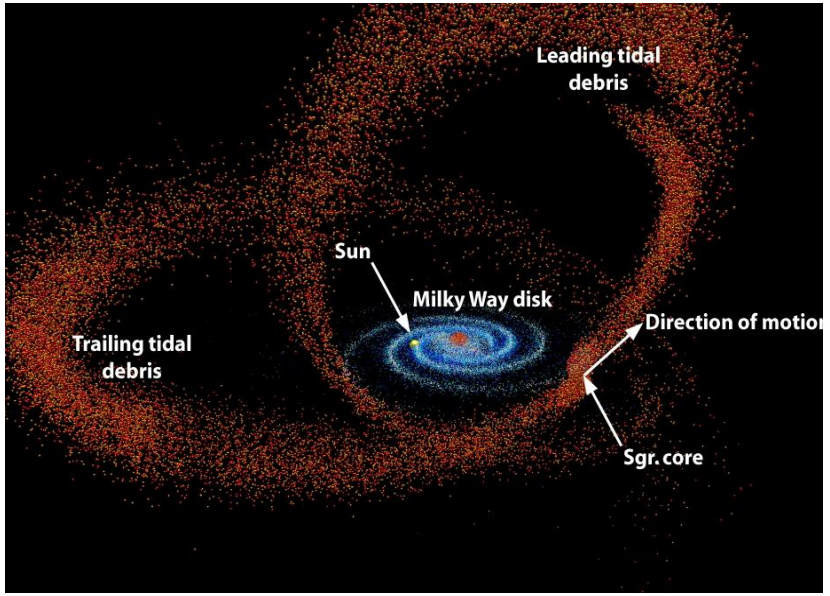
LMC

Gravitational interaction with MW & SMC
large amount of gas



Sgr

Gravitational interaction with MW
NO evidence of neutral atomic gas



comparison

LMC

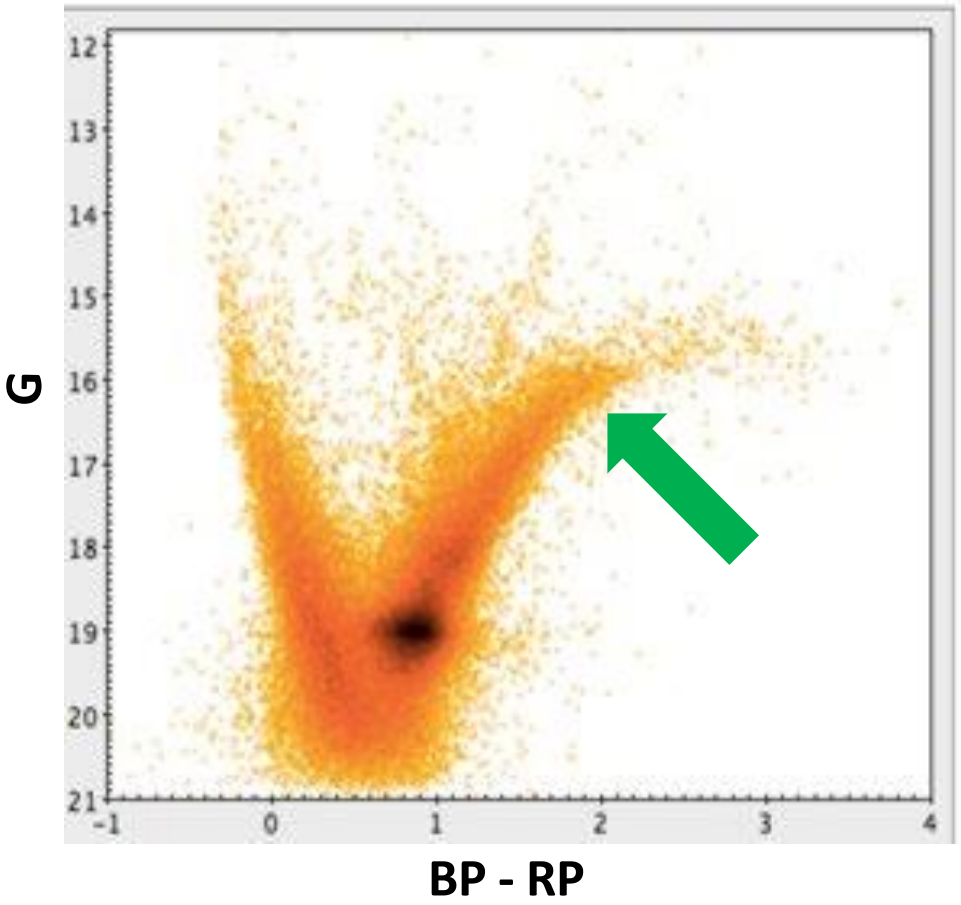
still on-going star formation

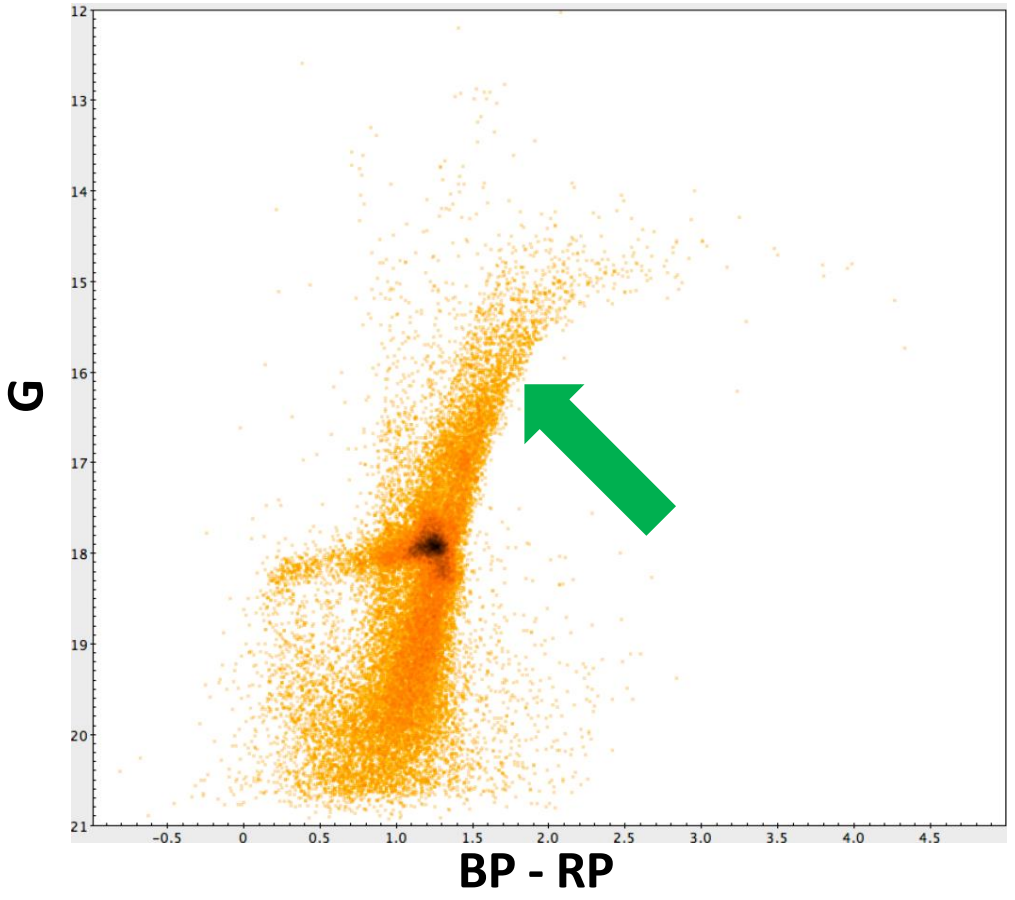
Sgr

NO star formation

dominant stellar population: int-age, metal-rich stars

secondary component: old, metal-poor stars





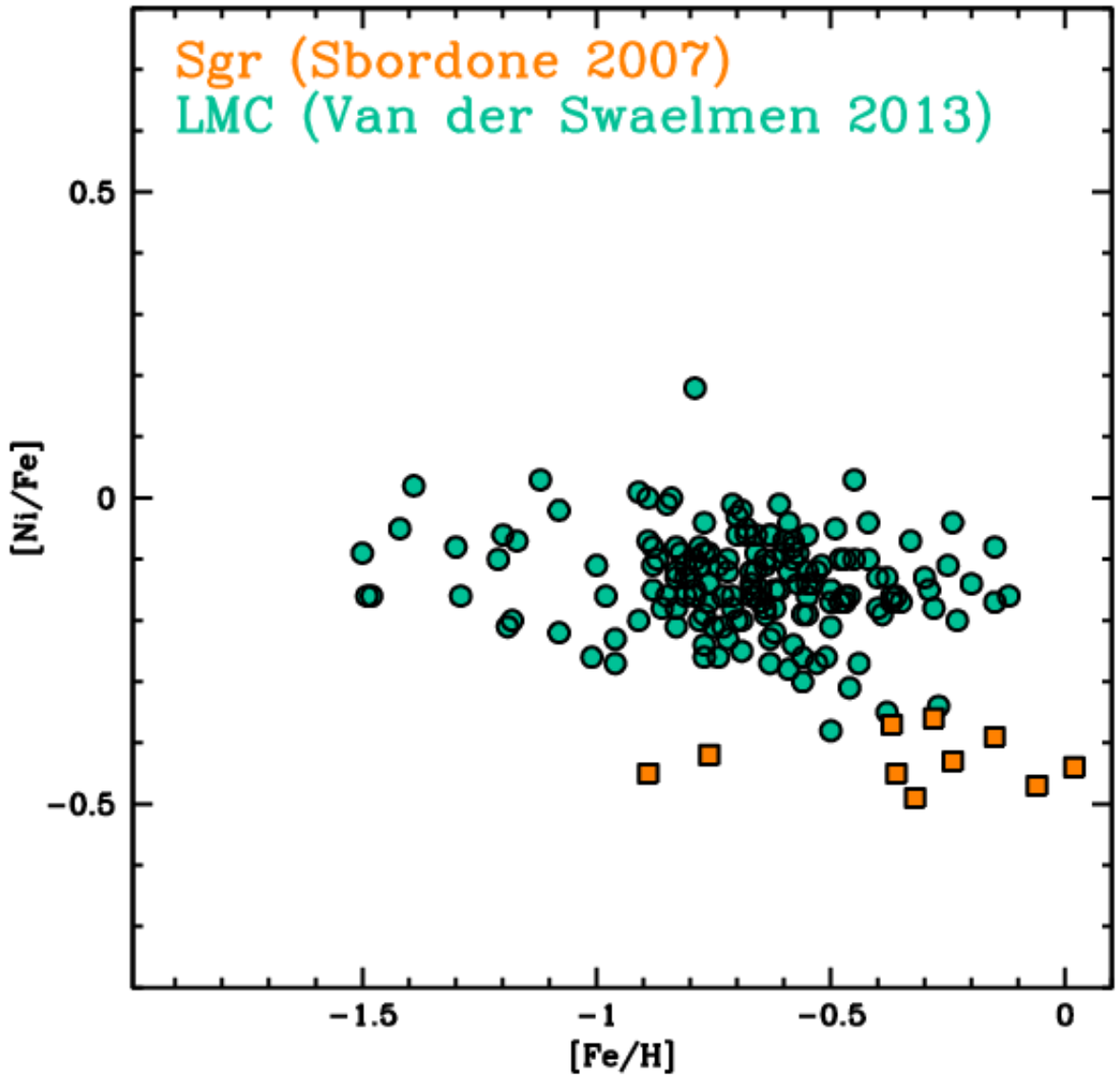
Scientific goal

Homogeneous comparison between
LMC & Sgr
for the main groups of elements

Analysis of **30** LMC + **25** Sgr RGB stars
with UVES spectra (R ~ 45000)

Homogeneous analysis:
same atomic data, atmospherical parameters
and solar values for all the spectra.

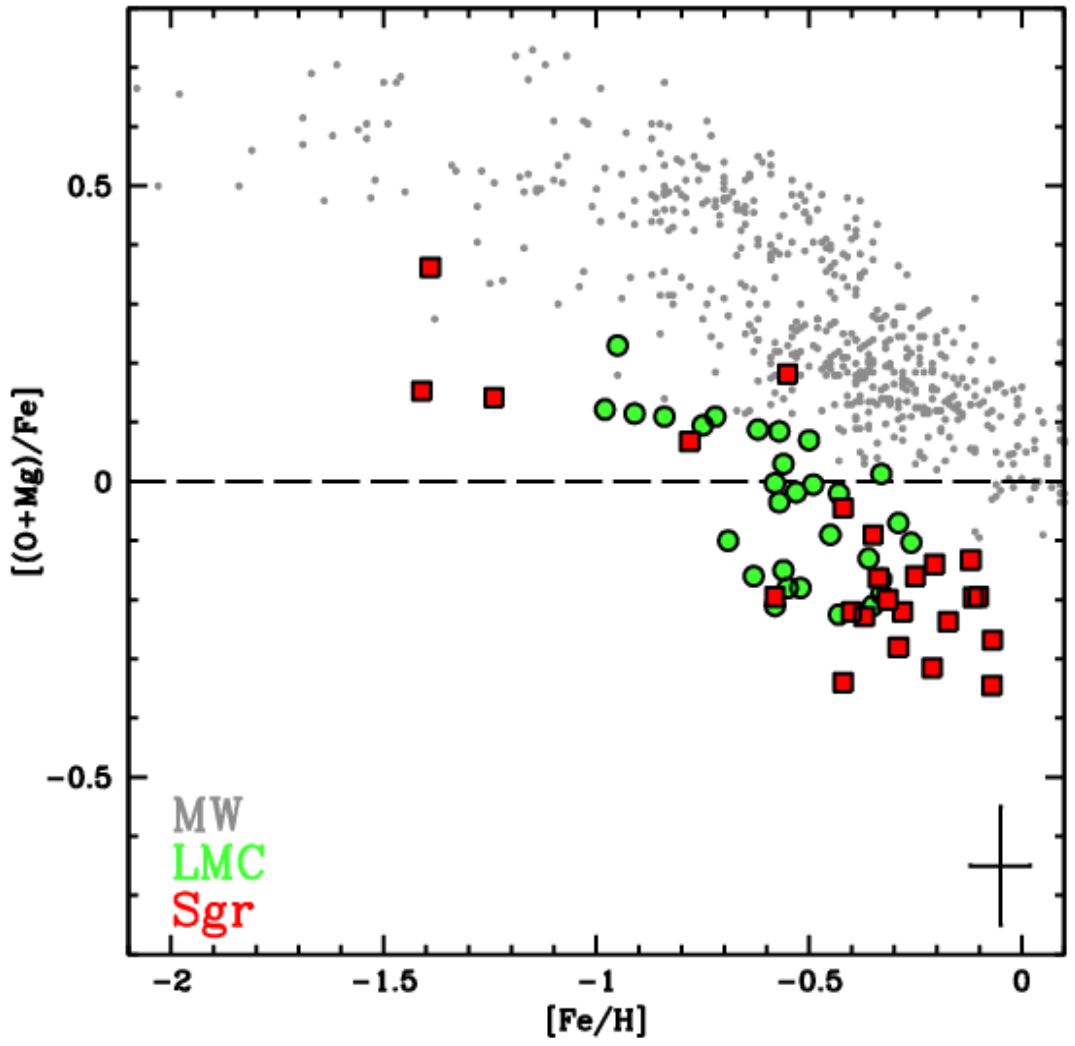
Scientific goal



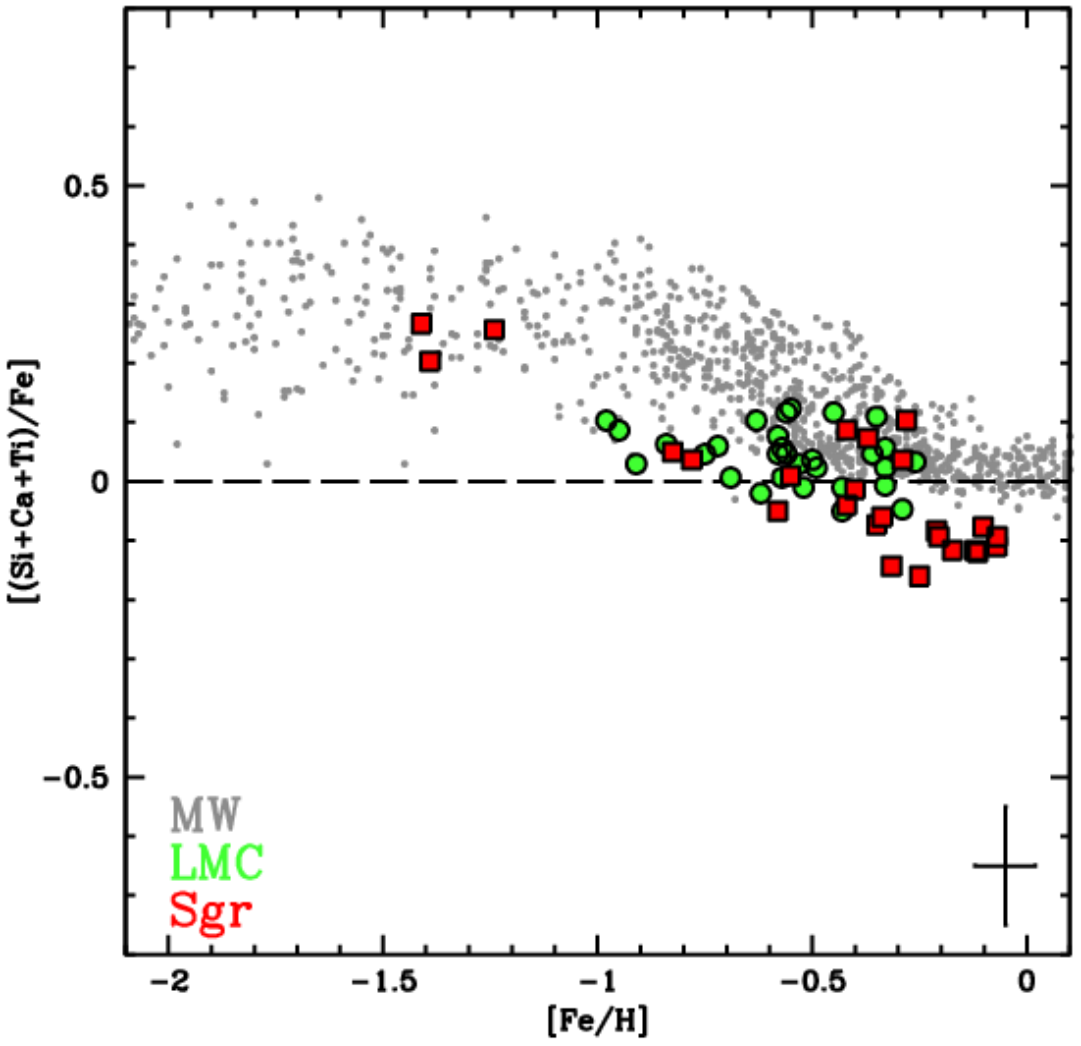
Real different abundances or systematics in the analyses???

α - elements

hydrostatic (O-Mg)



explosive (Si-Ca-Ti)



α - elements

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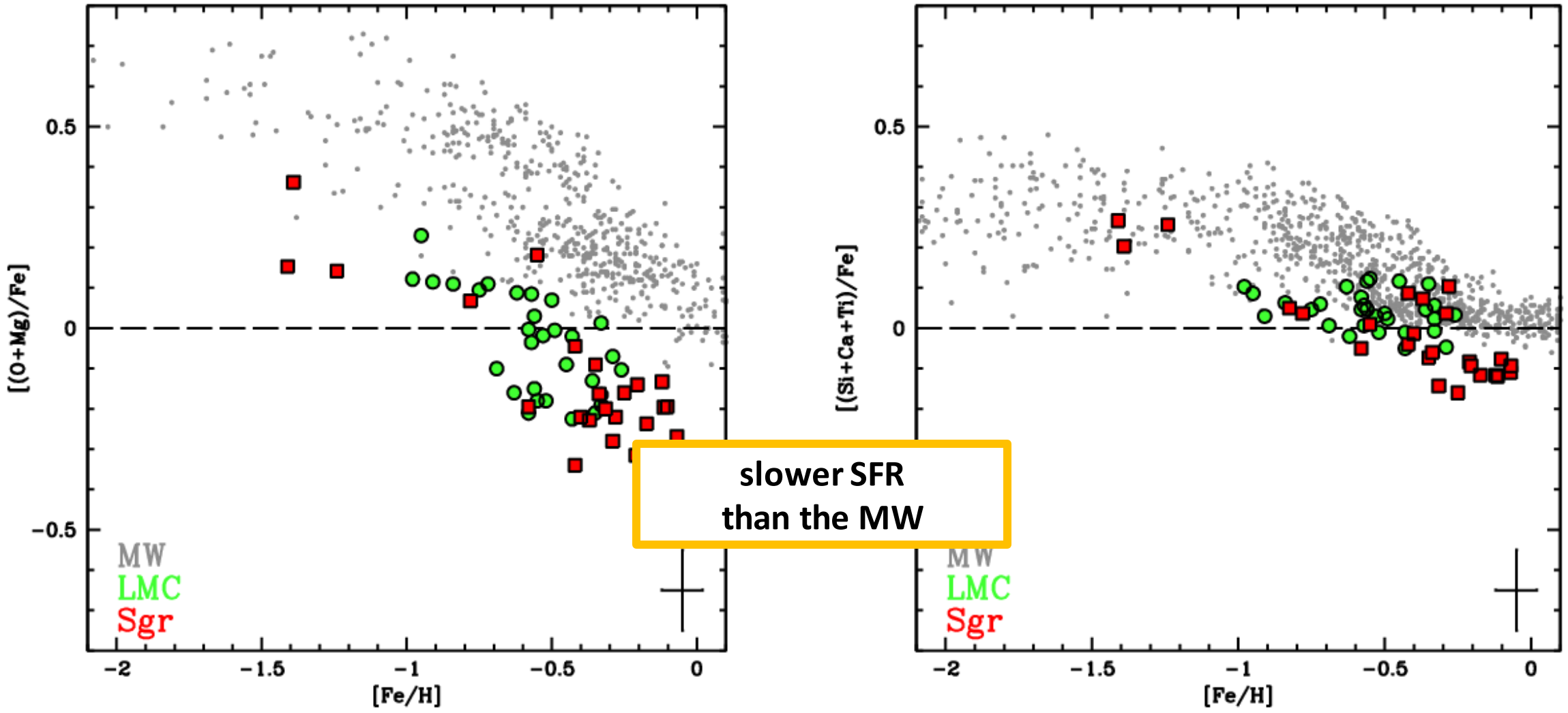
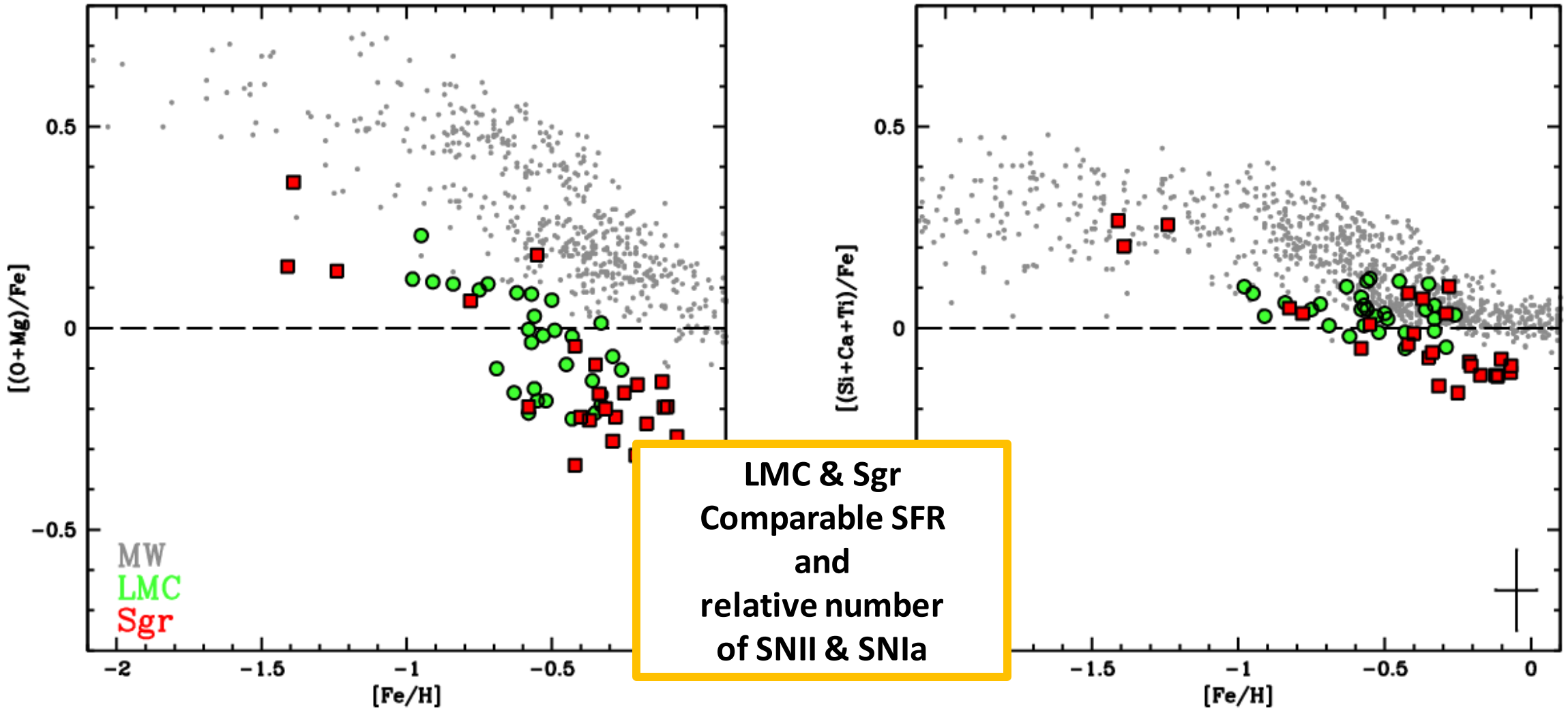


slower SFR
than the MW

α - elements

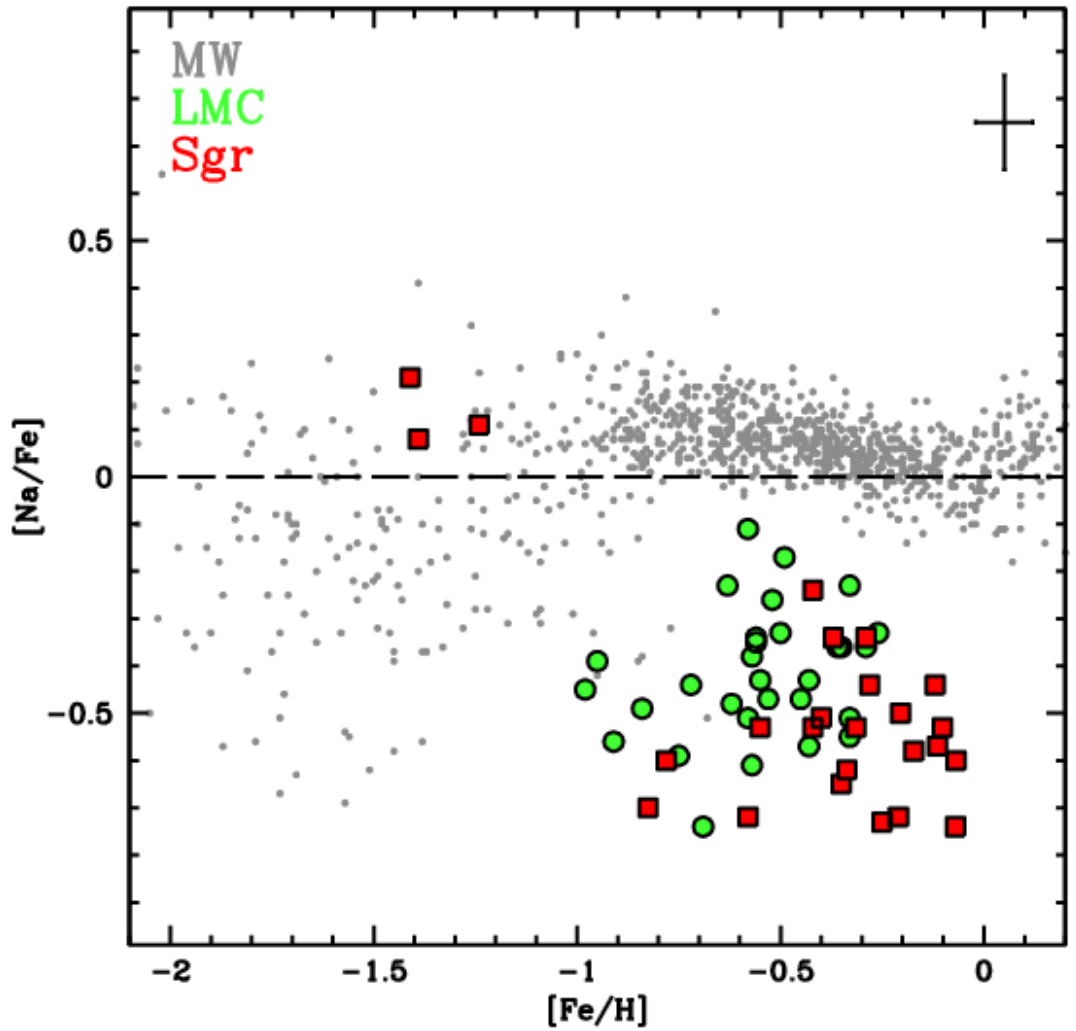
hydrostatic (O-Mg)

explosive (Si-Ca-Ti)

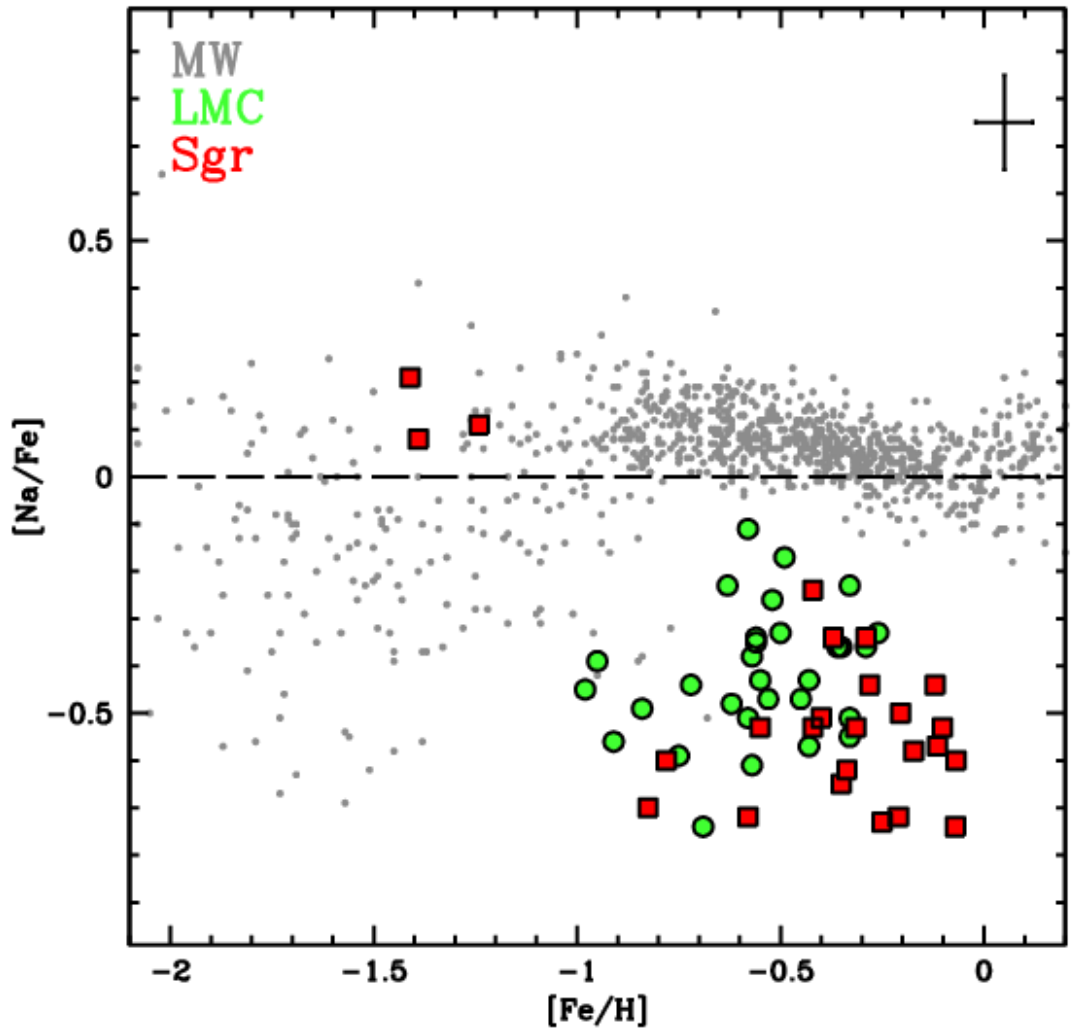


LMC & Sgr
Comparable SFR
and
relative number
of SNII & SNIa

light – element: Na

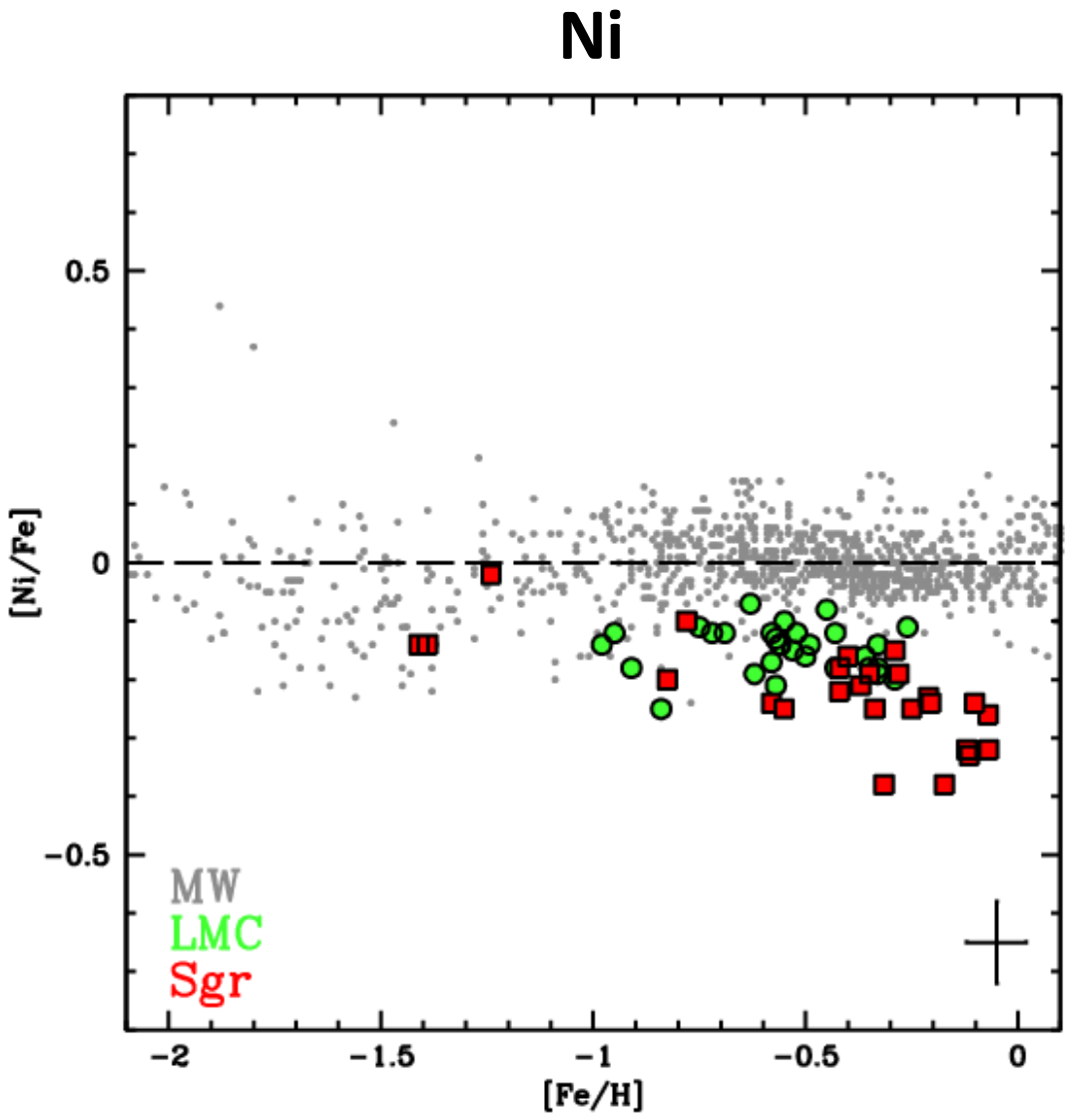


light – element: Na

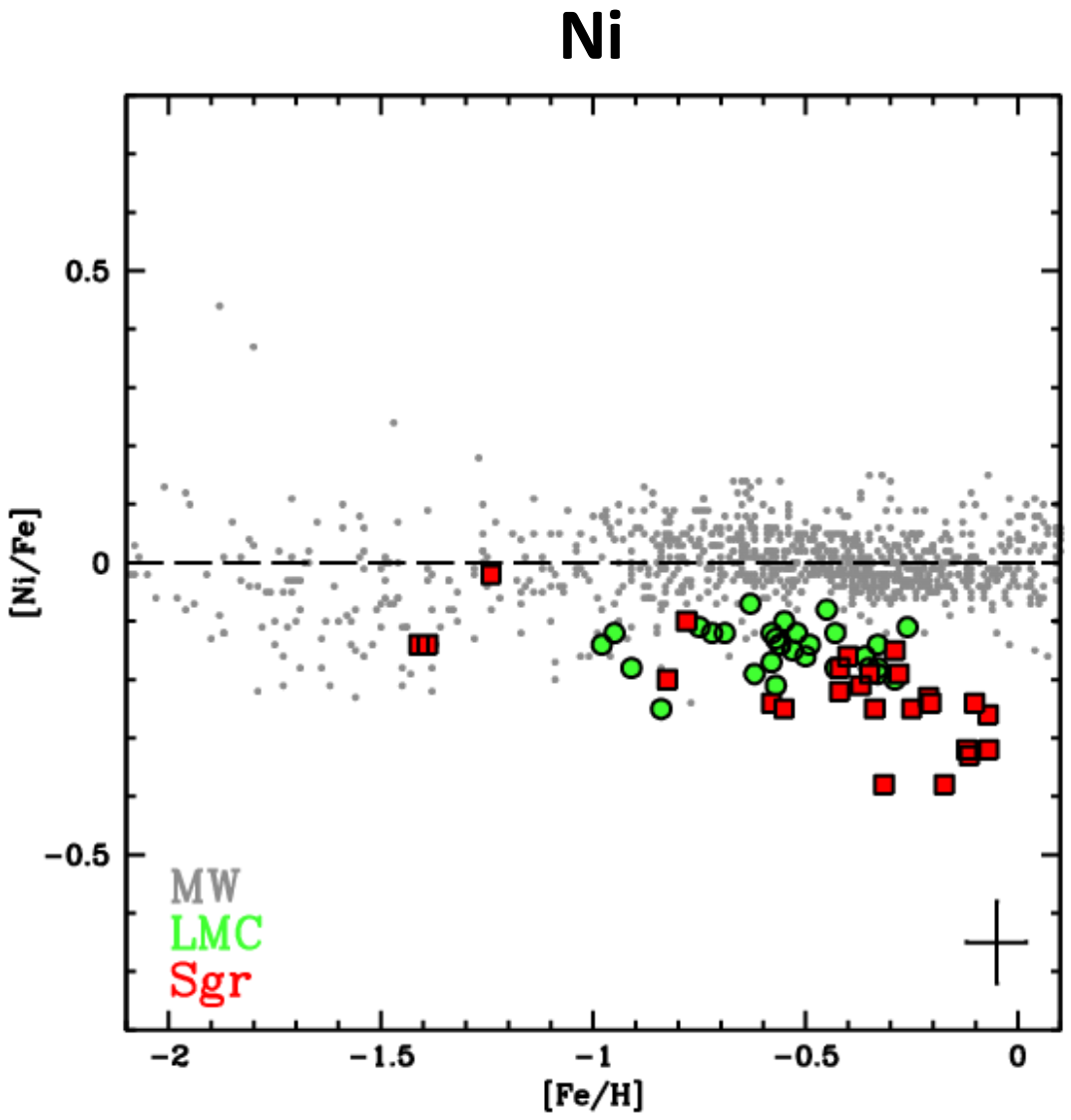


LMC & Sgr same trend: similar fraction of SNII

Iron peak - elements



Iron peak - elements

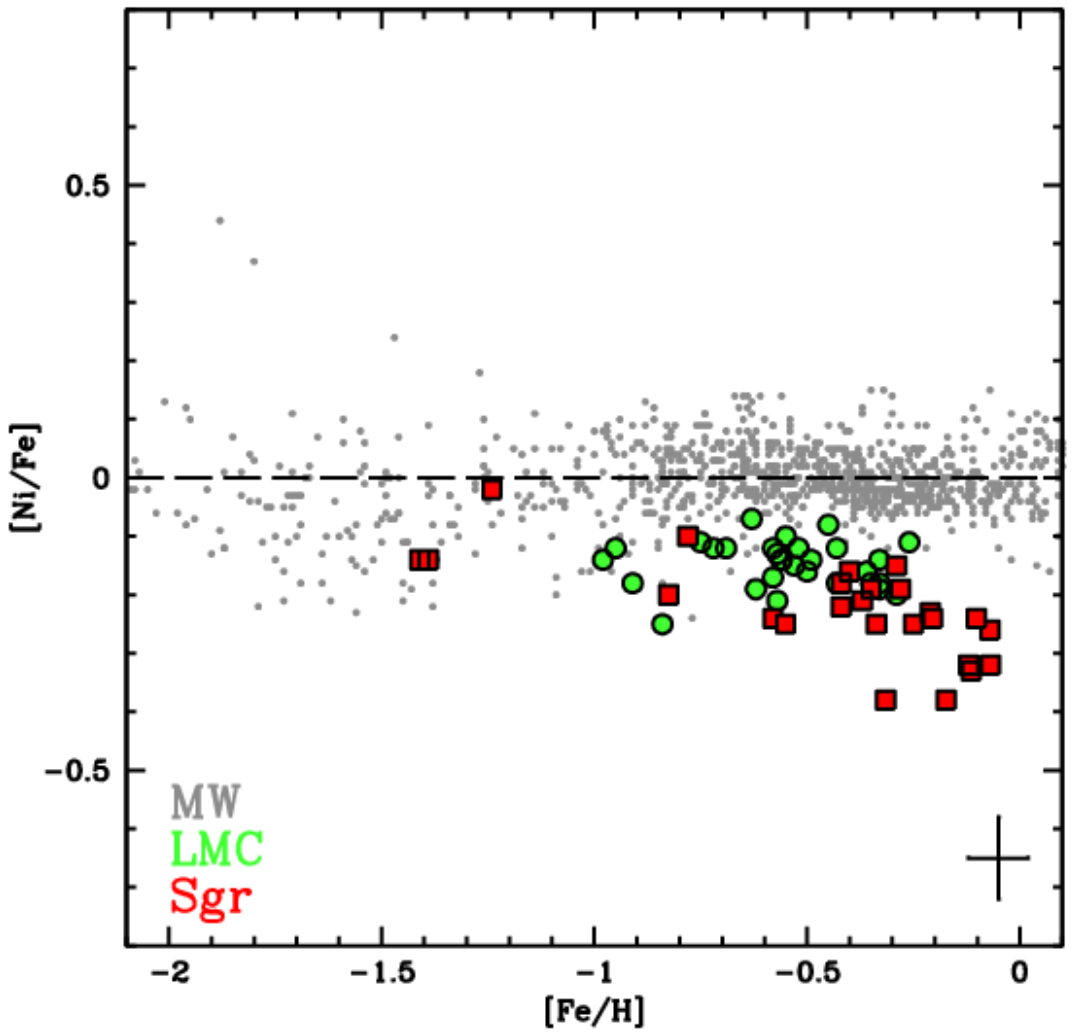


Abundance of Ni is metallicity dependent

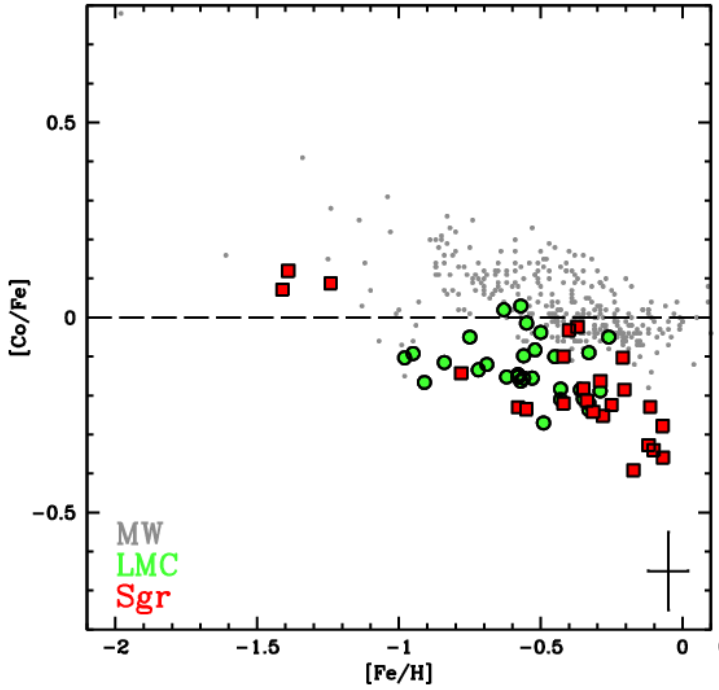
Similar behaviour in both galaxies

Iron peak - elements

Ni



Co



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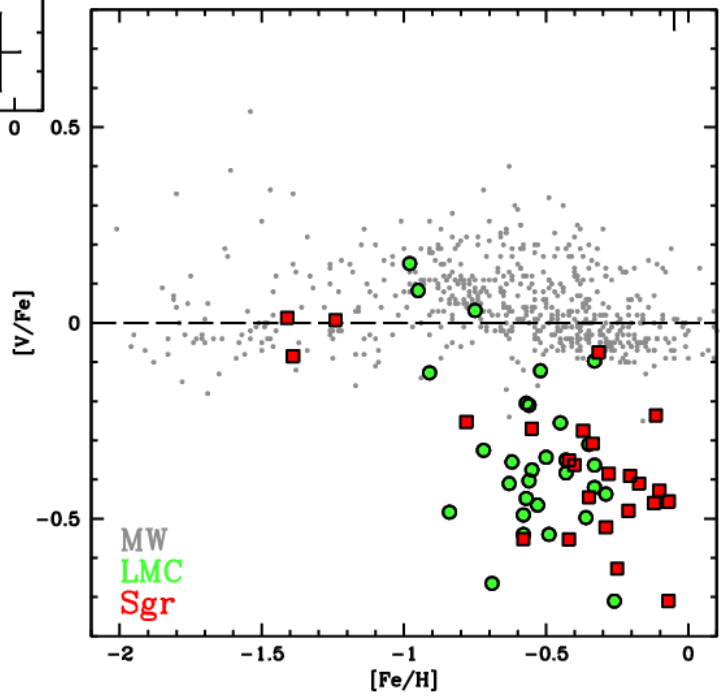
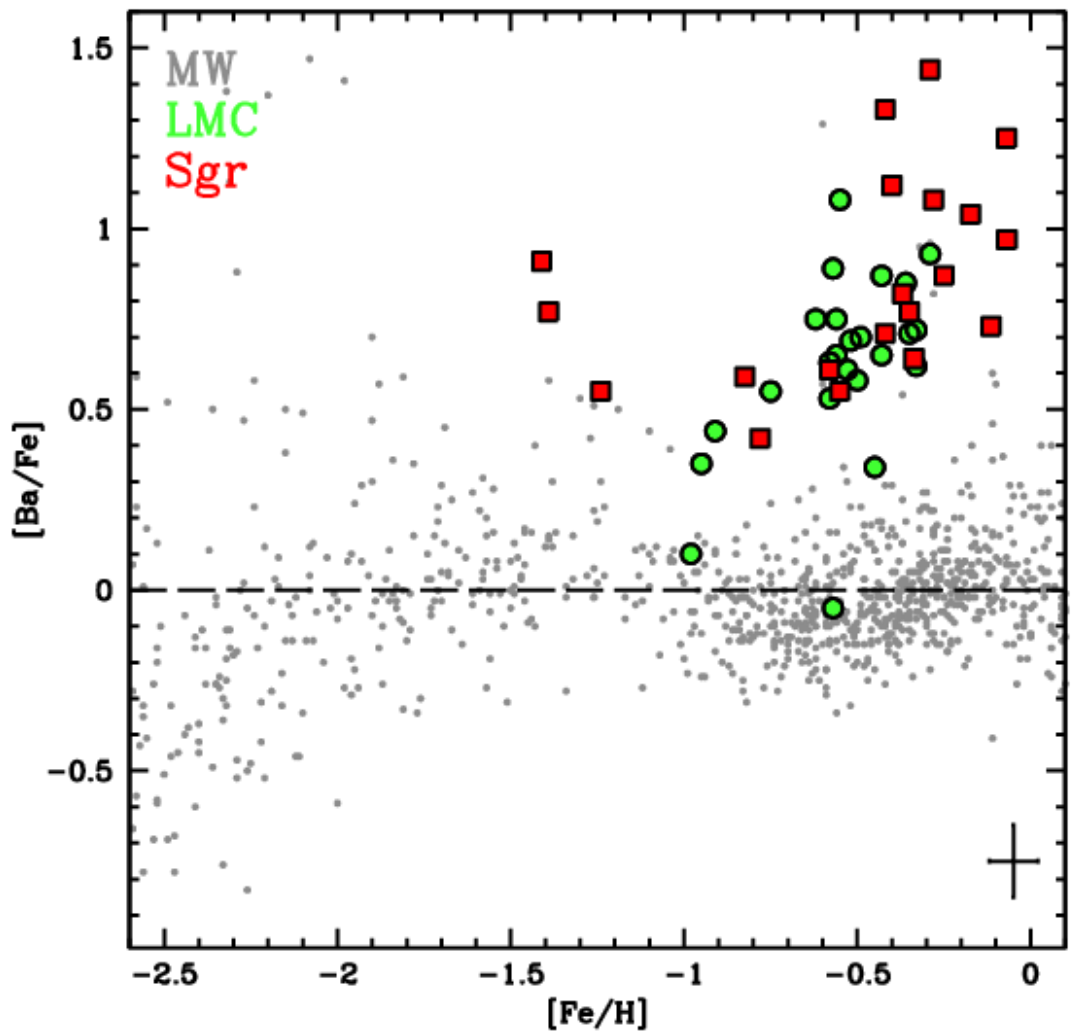
V



S-process element: Ba



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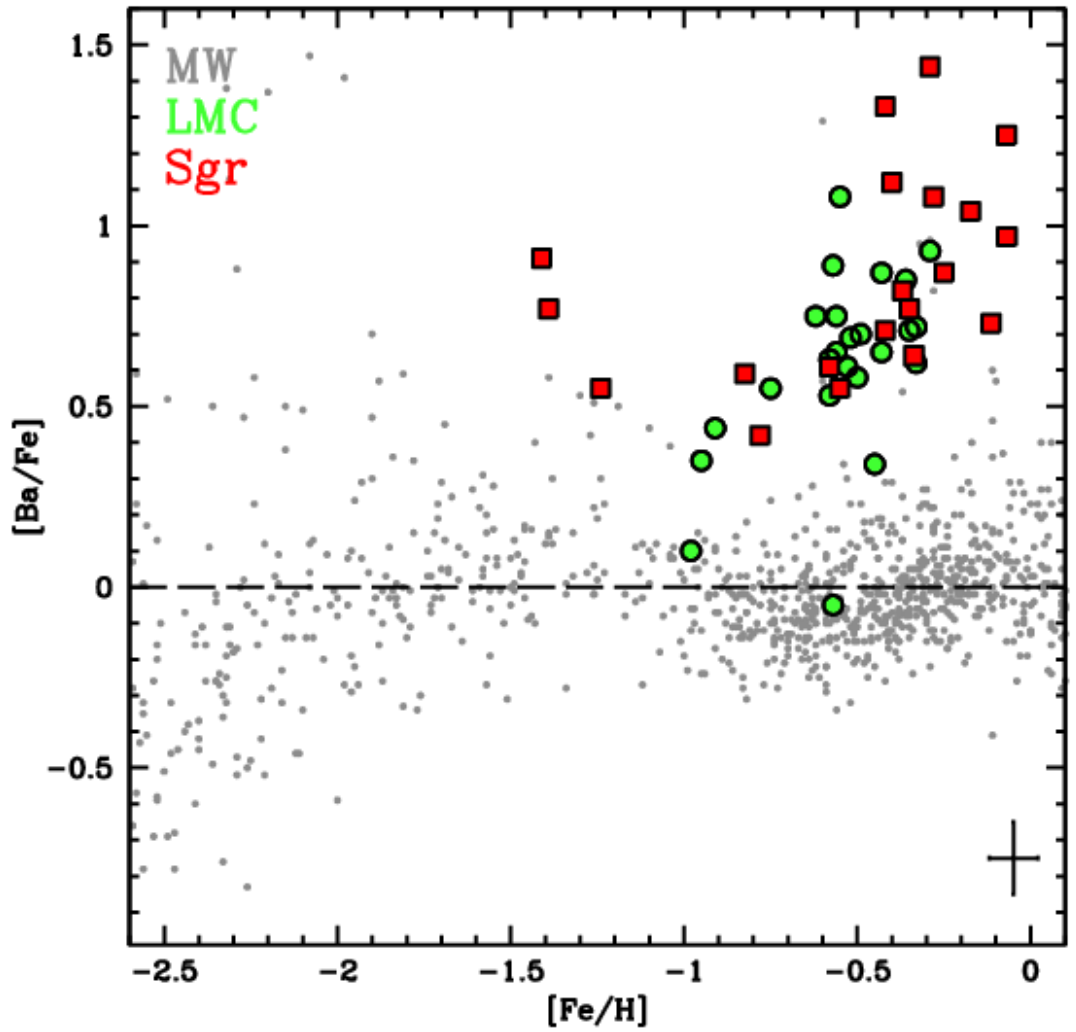
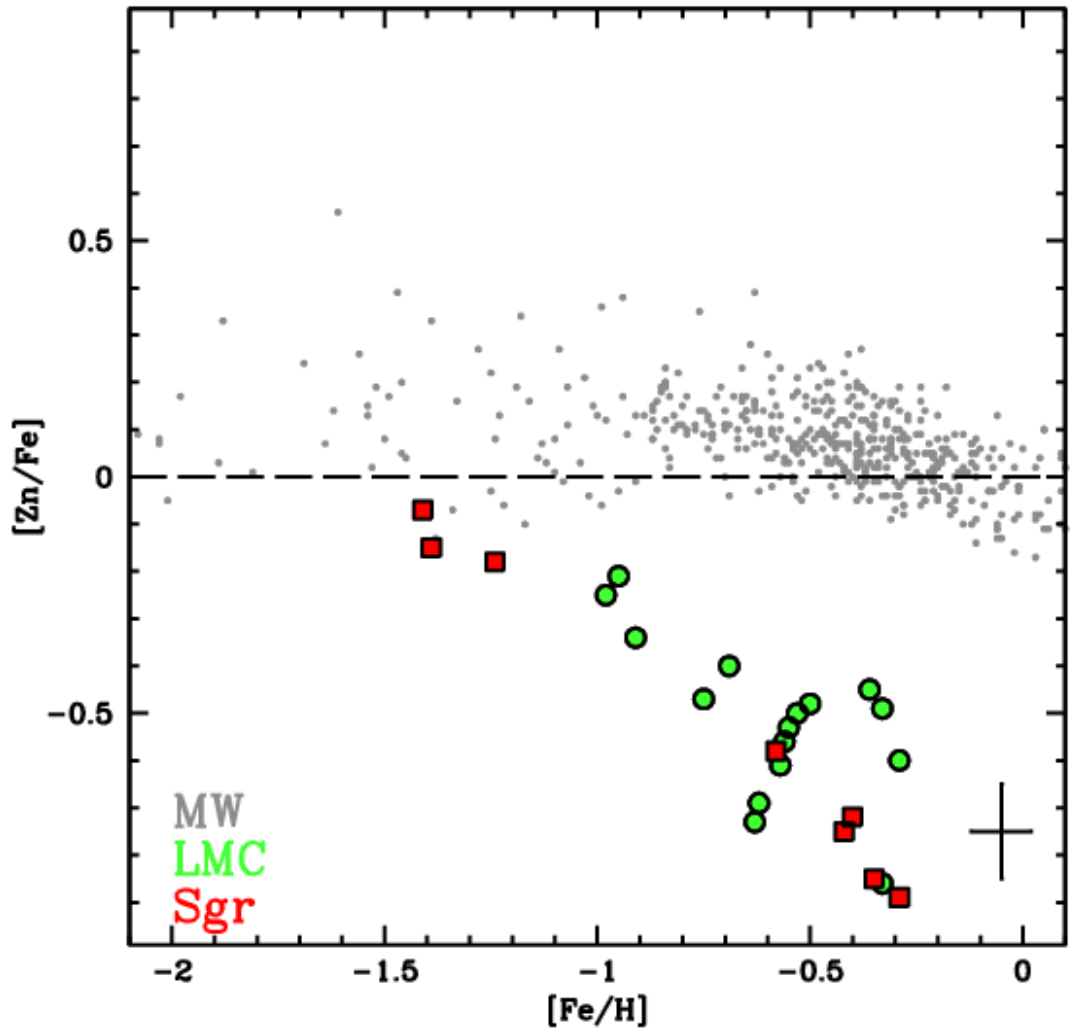


LMC & Sgr similar contribution from low mass AGB stars

A new diagnostic: Zn



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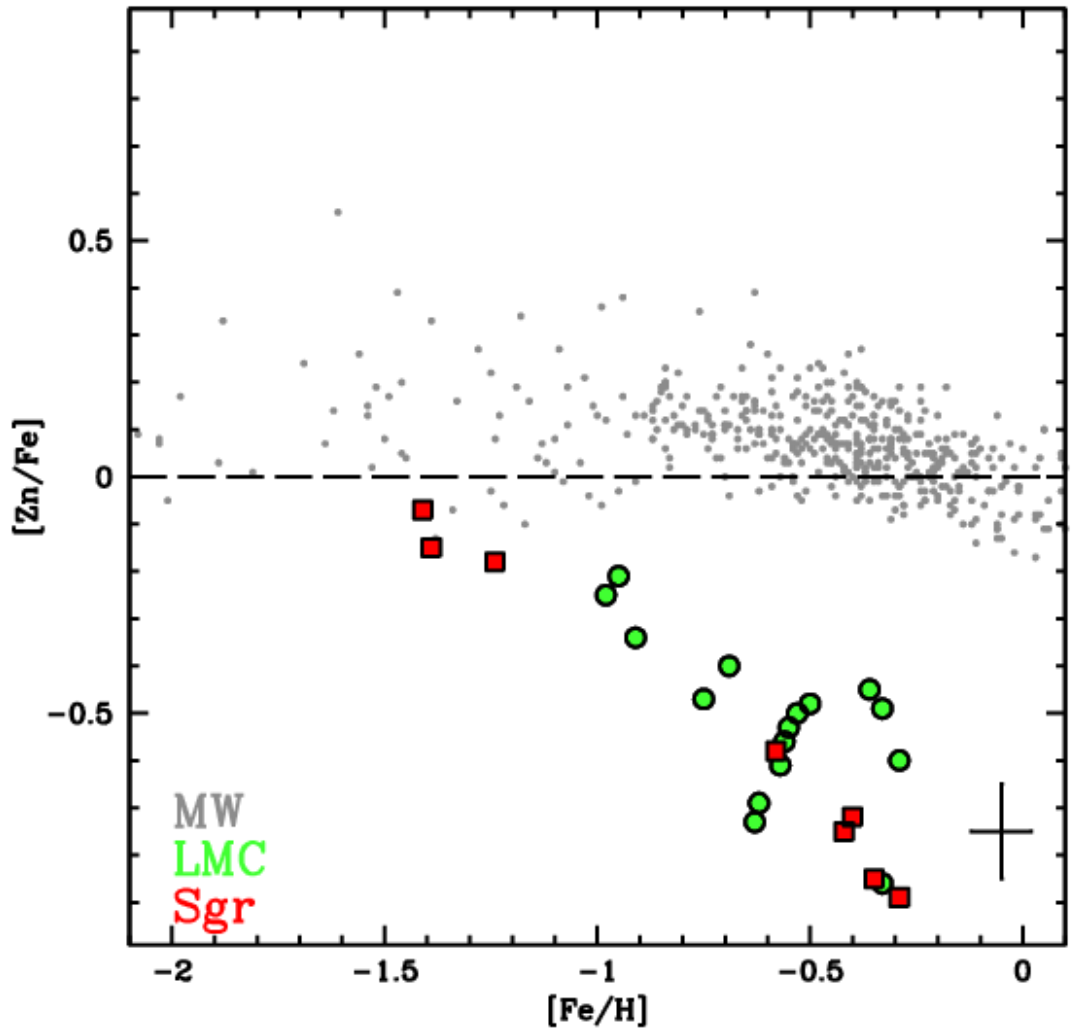
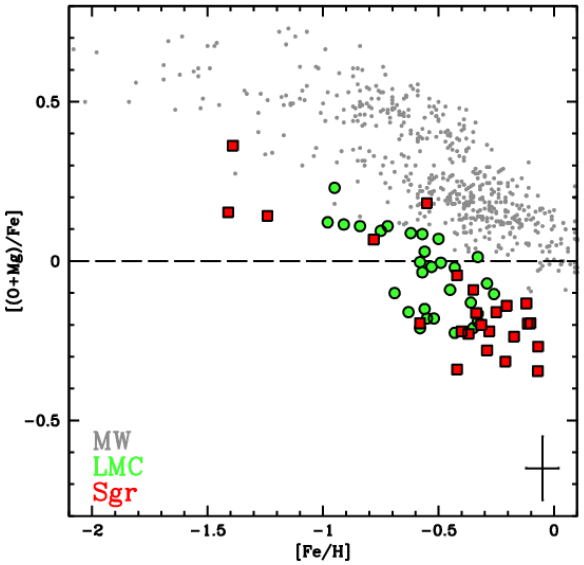


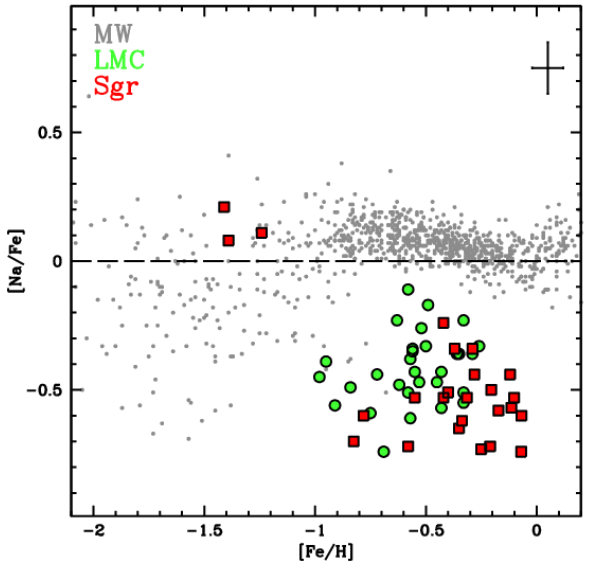
A new chemical distinguish feature between LMC/Sgr & MW

Summary

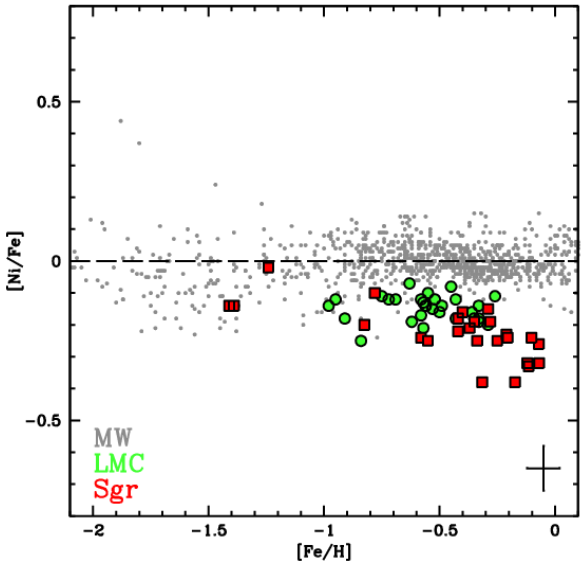
α-elements



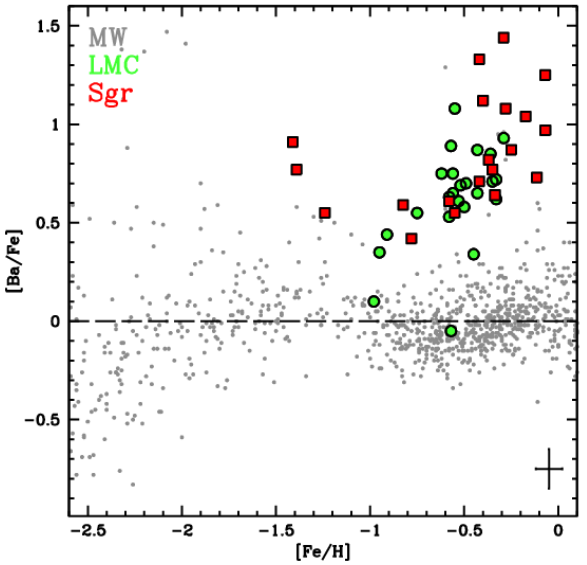
light elements



Fe-peak elements



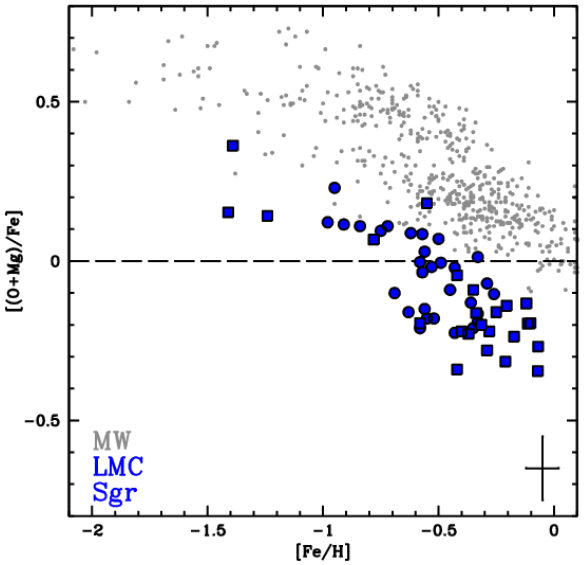
Neutron capture elements



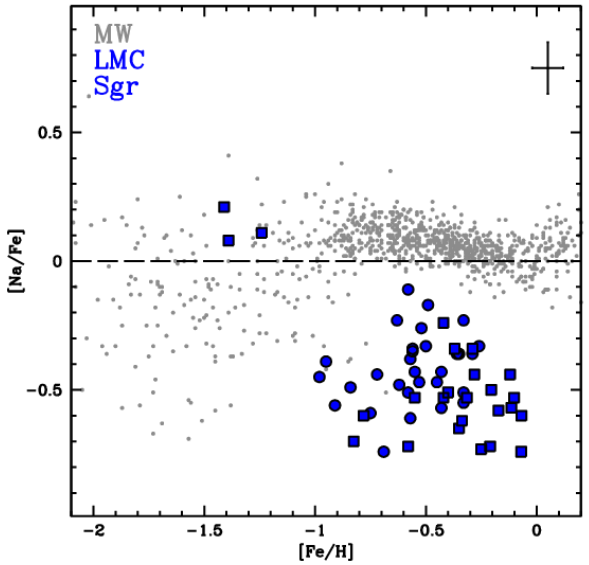
LMC & Sgr experienced a very similar chemical enrichment history

Summary

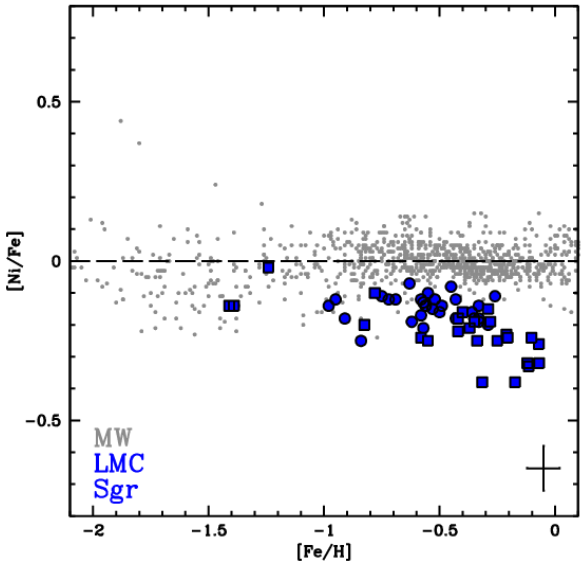
α-elements



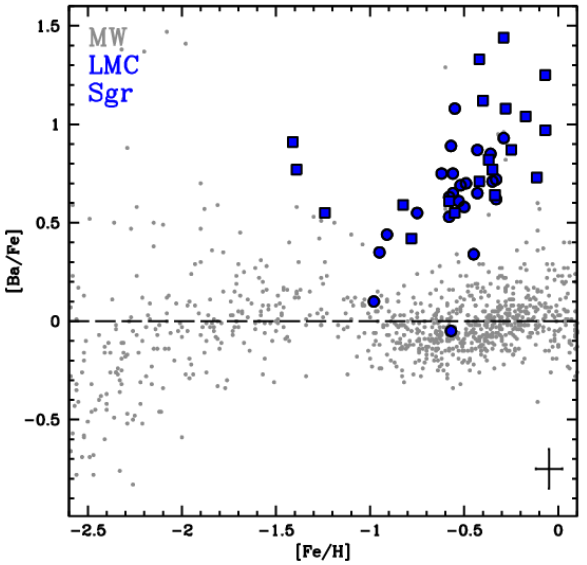
light elements



Fe-peak elements



Neutron capture elements

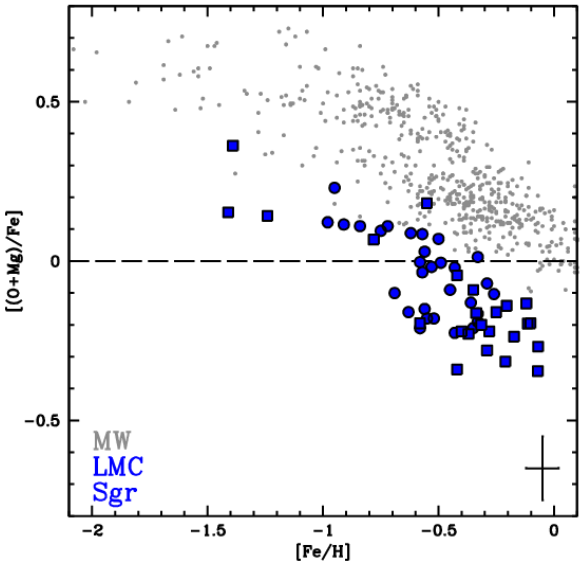


LMC & Sgr experienced a very similar chemical enrichment history

The two galaxies are unrecognisable
Unique continue sequence

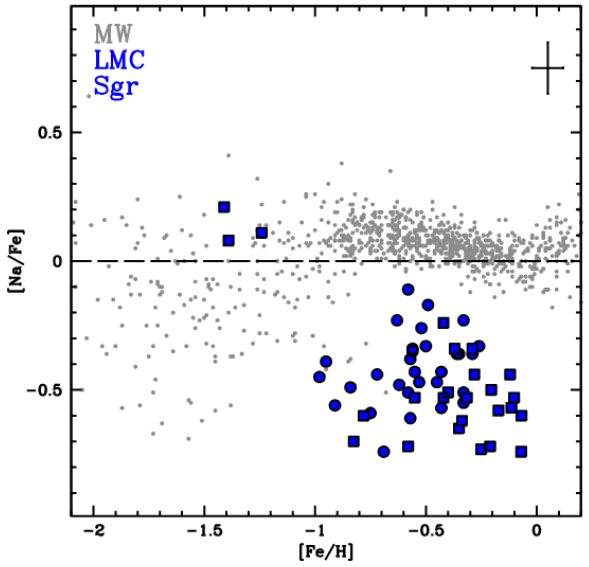
Summary

α-elements



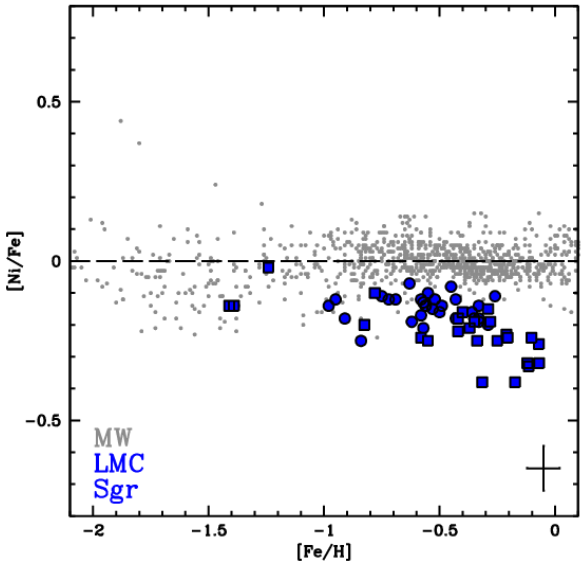
LMC & Sgr
Comparable SFR
and
relative number
of SNII & SNIa

light elements



LMC & Sgr
same trend:
similar fraction
of SNII

Fe-peak elements



Abundance of Ni
is metallicity
dependent

Similar behaviour
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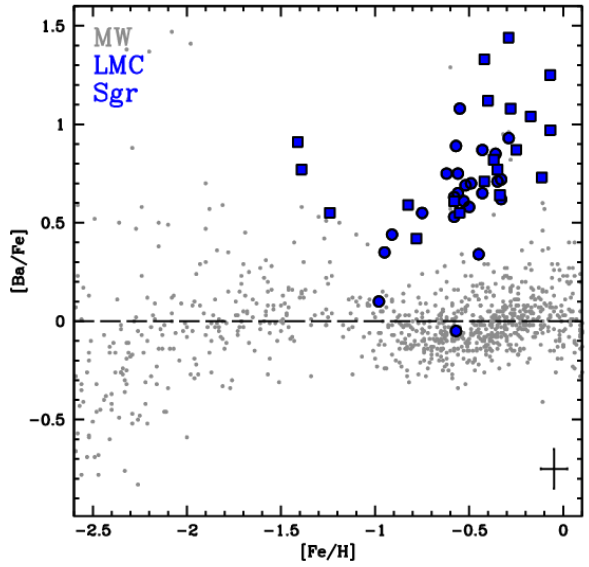
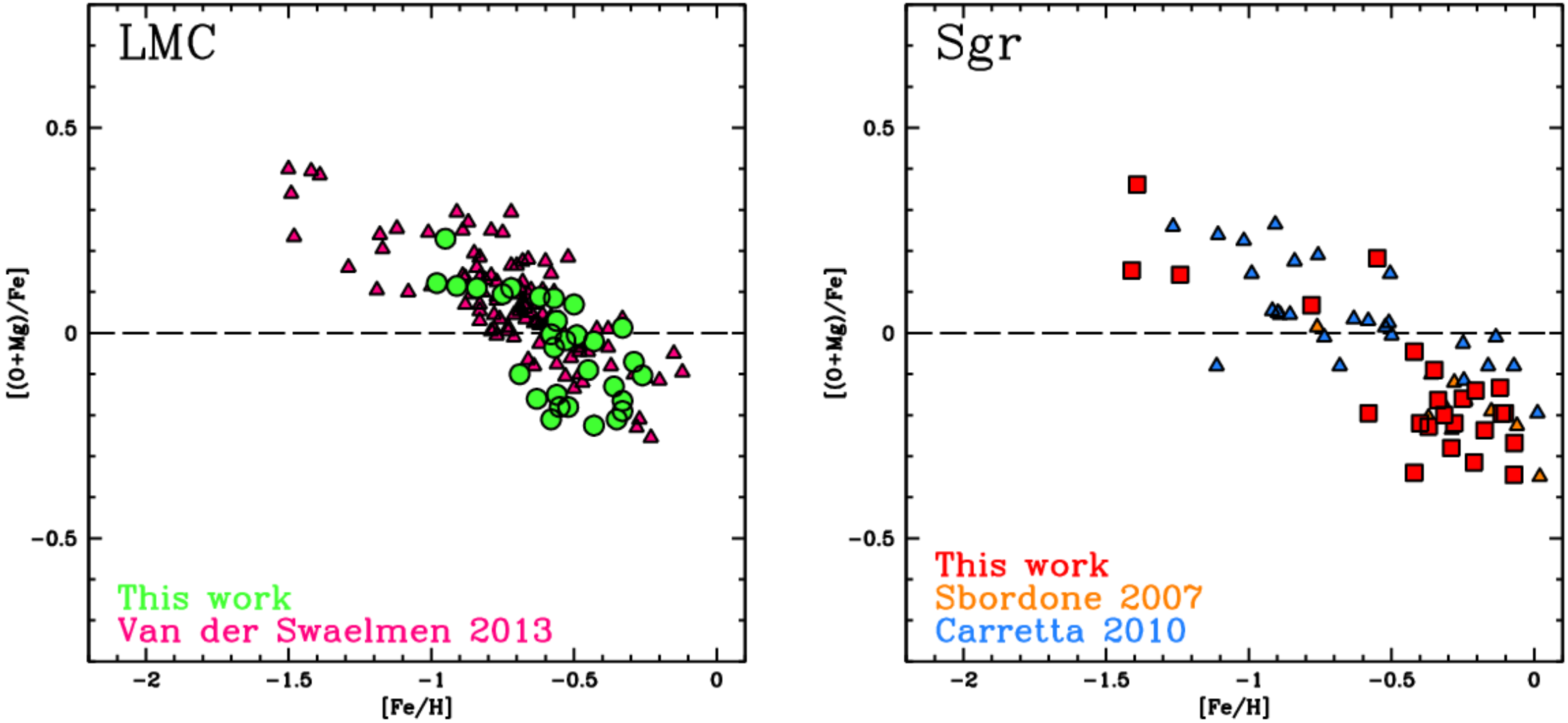
Neutron capture elements



LMC & Sgr
similar
contribution
from low mass
AGB stars

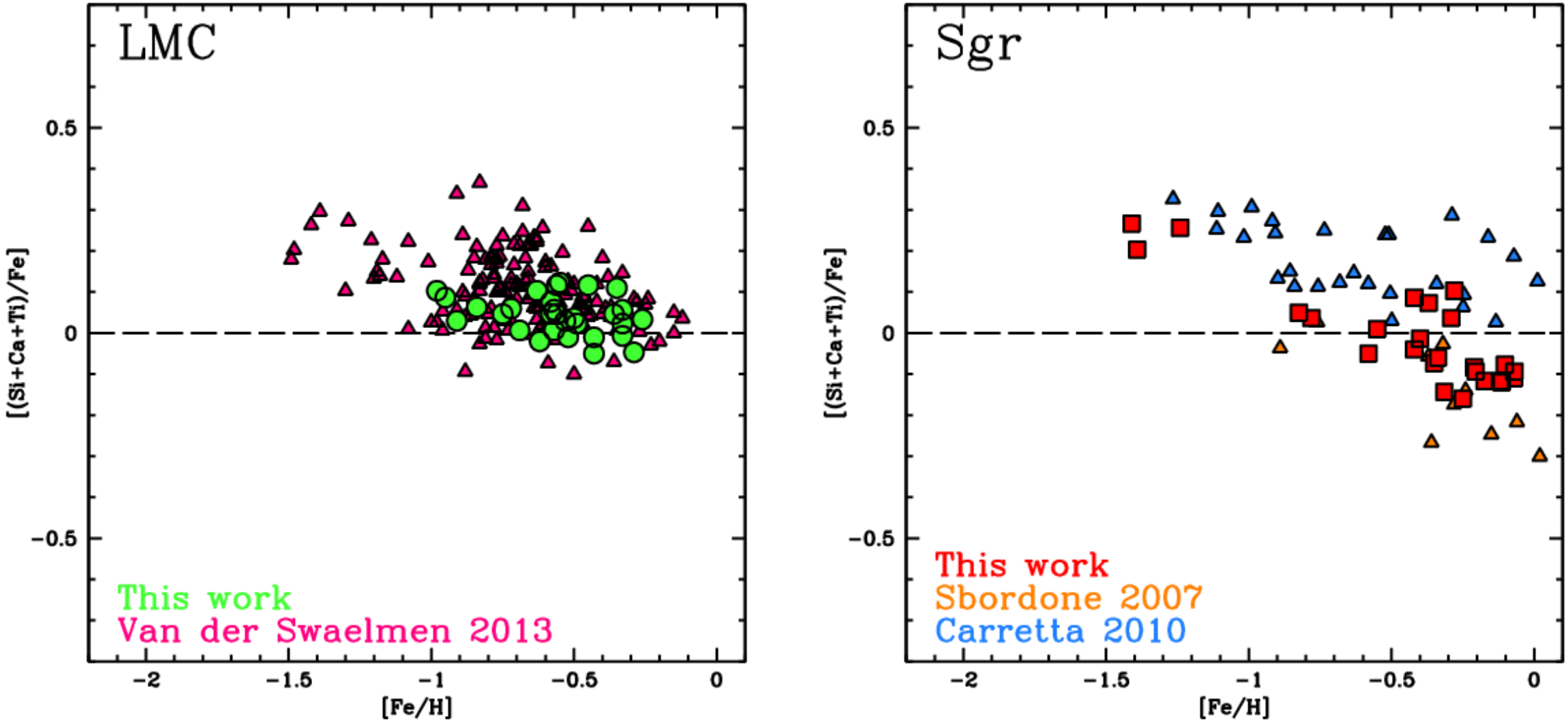
comparison with other work

O+Mg



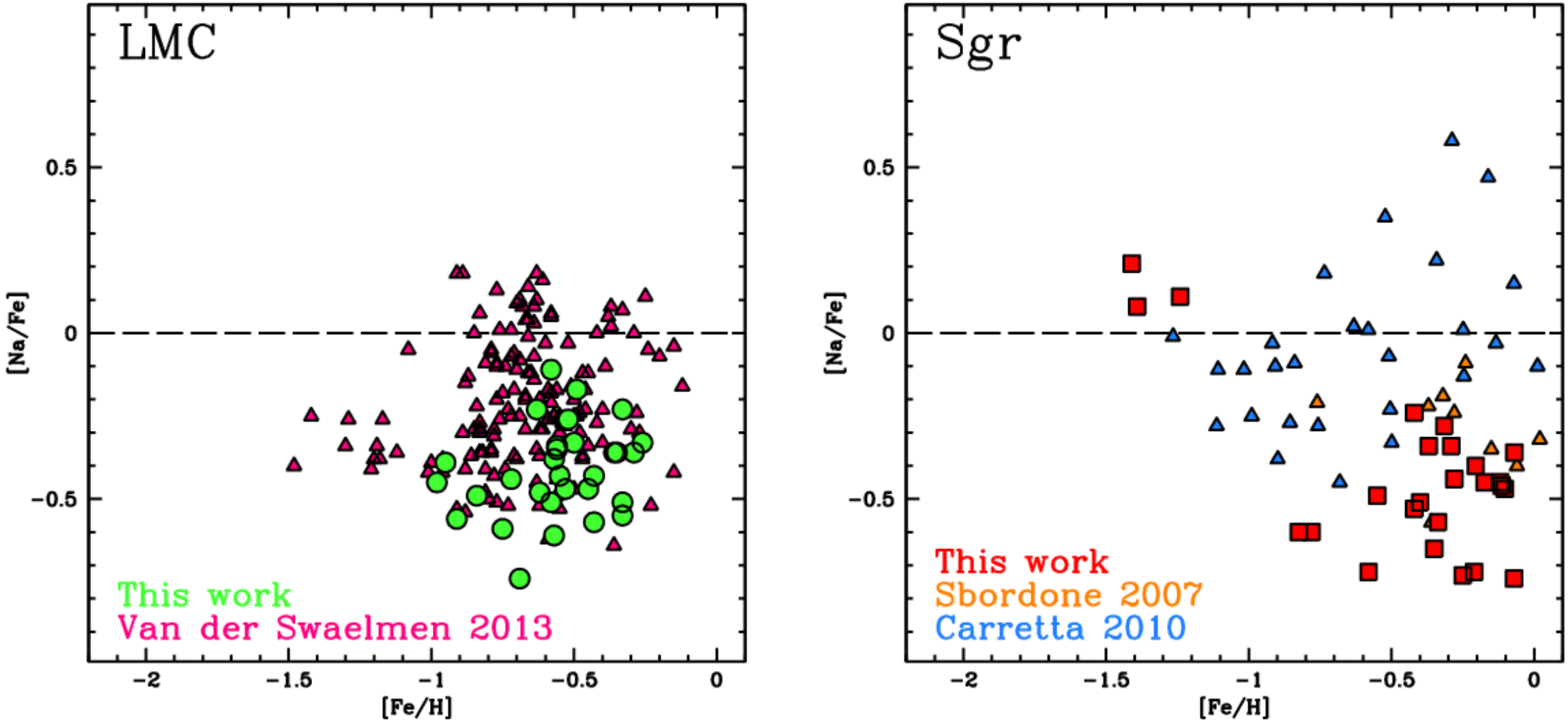
comparison with other work

Si+Ca+Ti



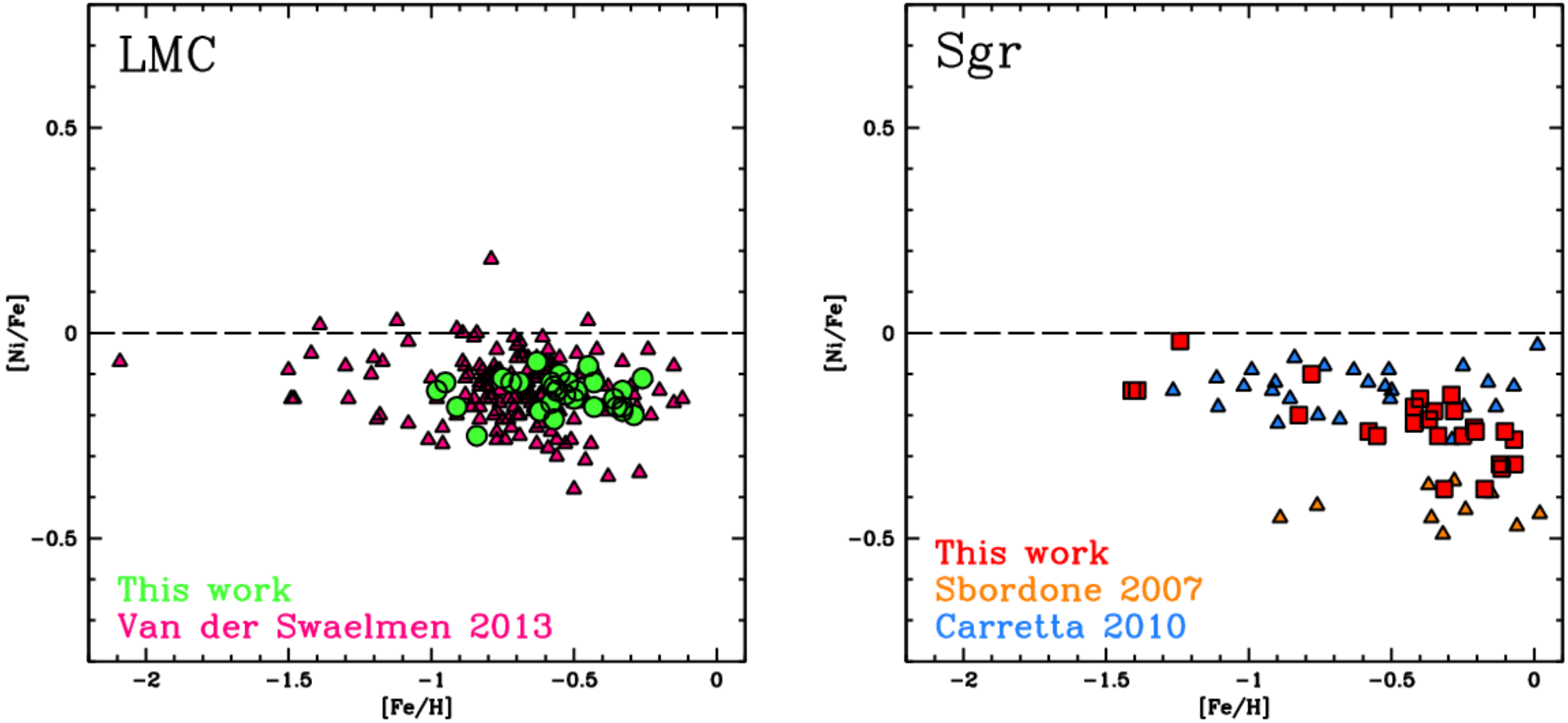
comparison with other work

Na



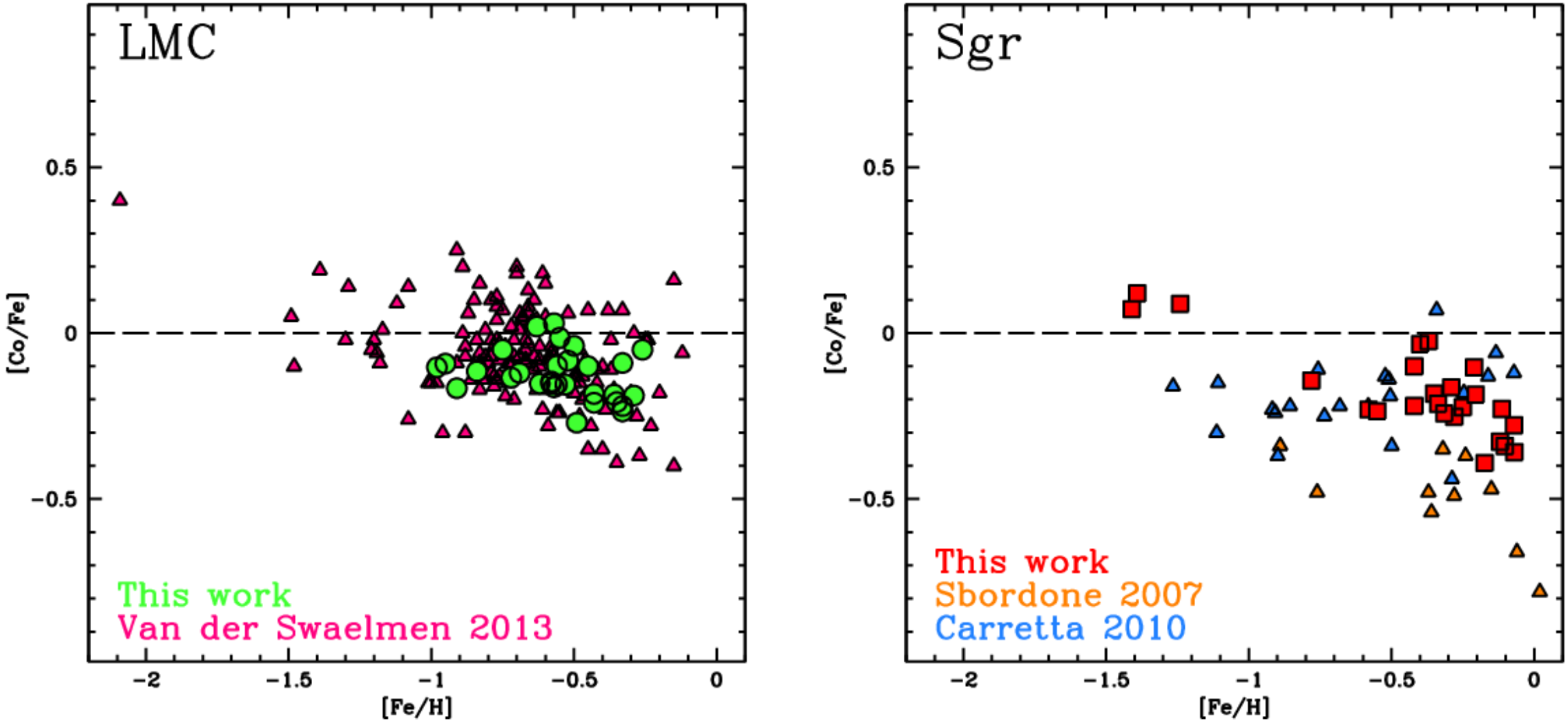
comparison with other work

Ni



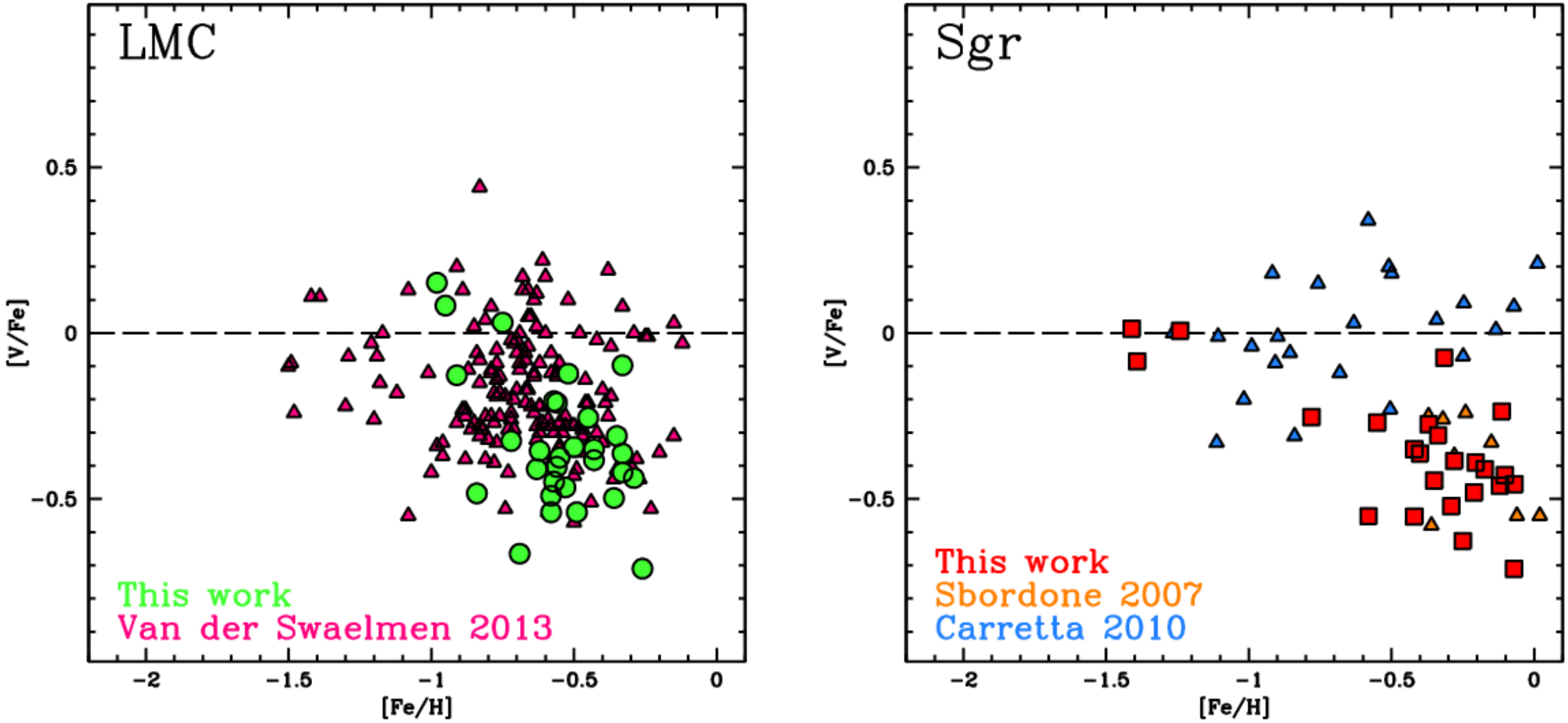
comparison with other work

Co



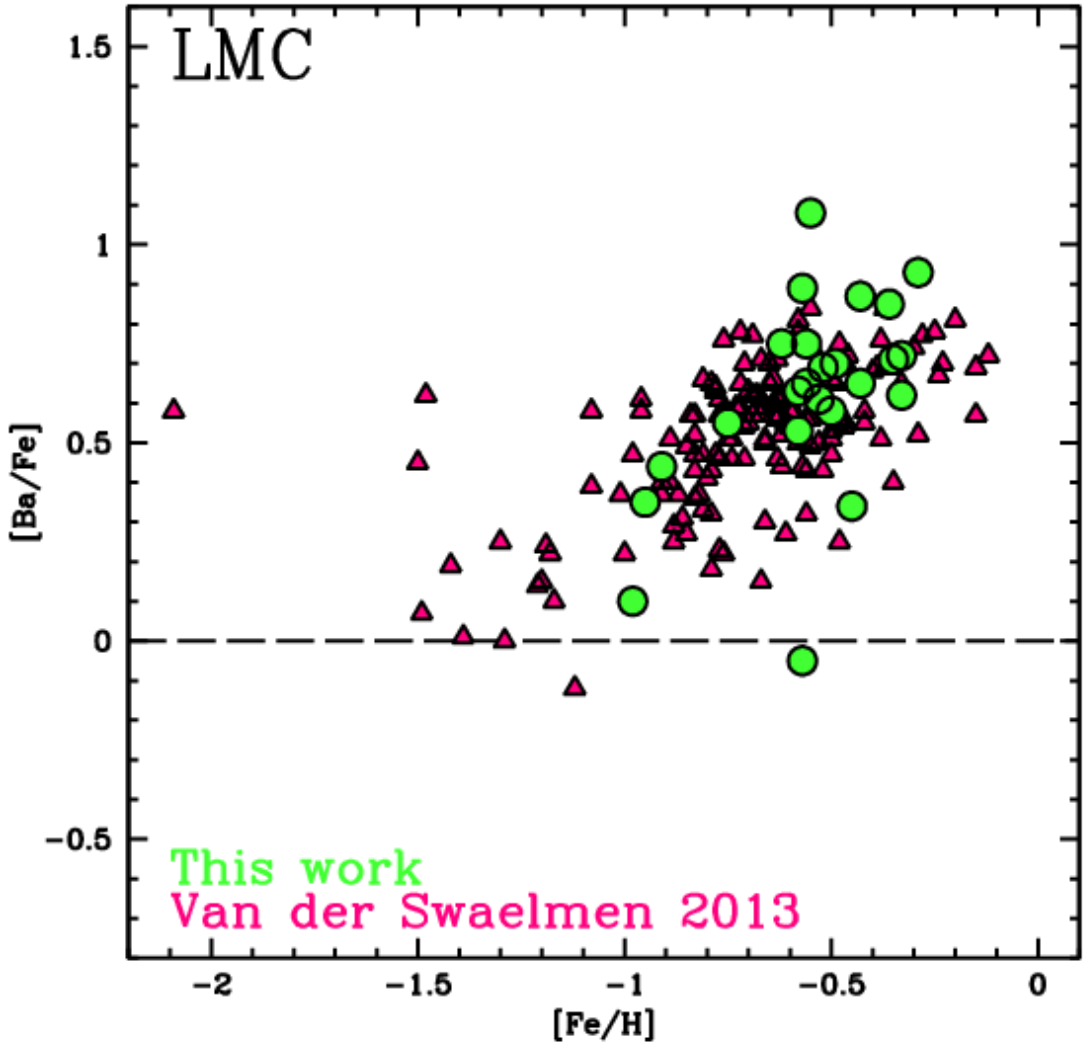
comparison with other work

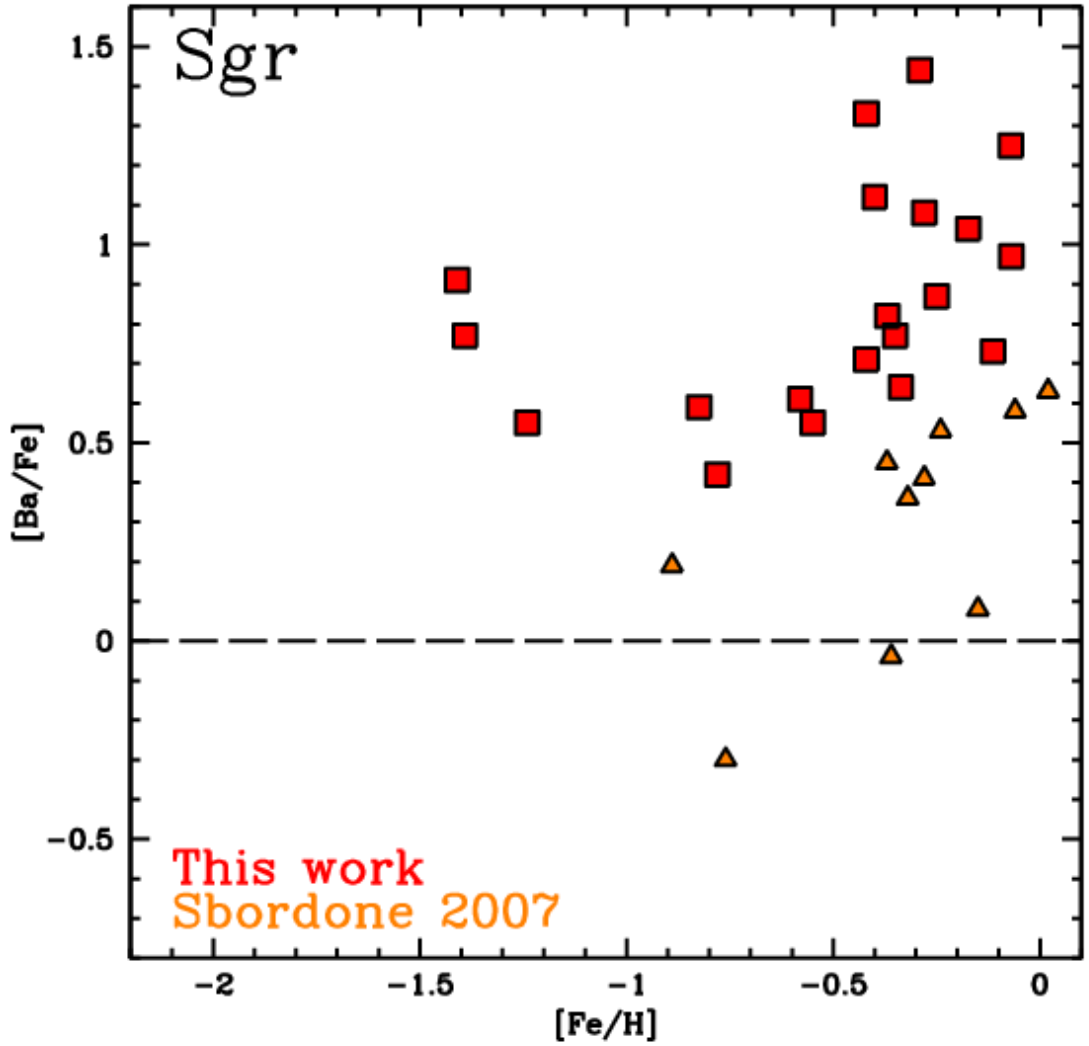
V



comparison with other work

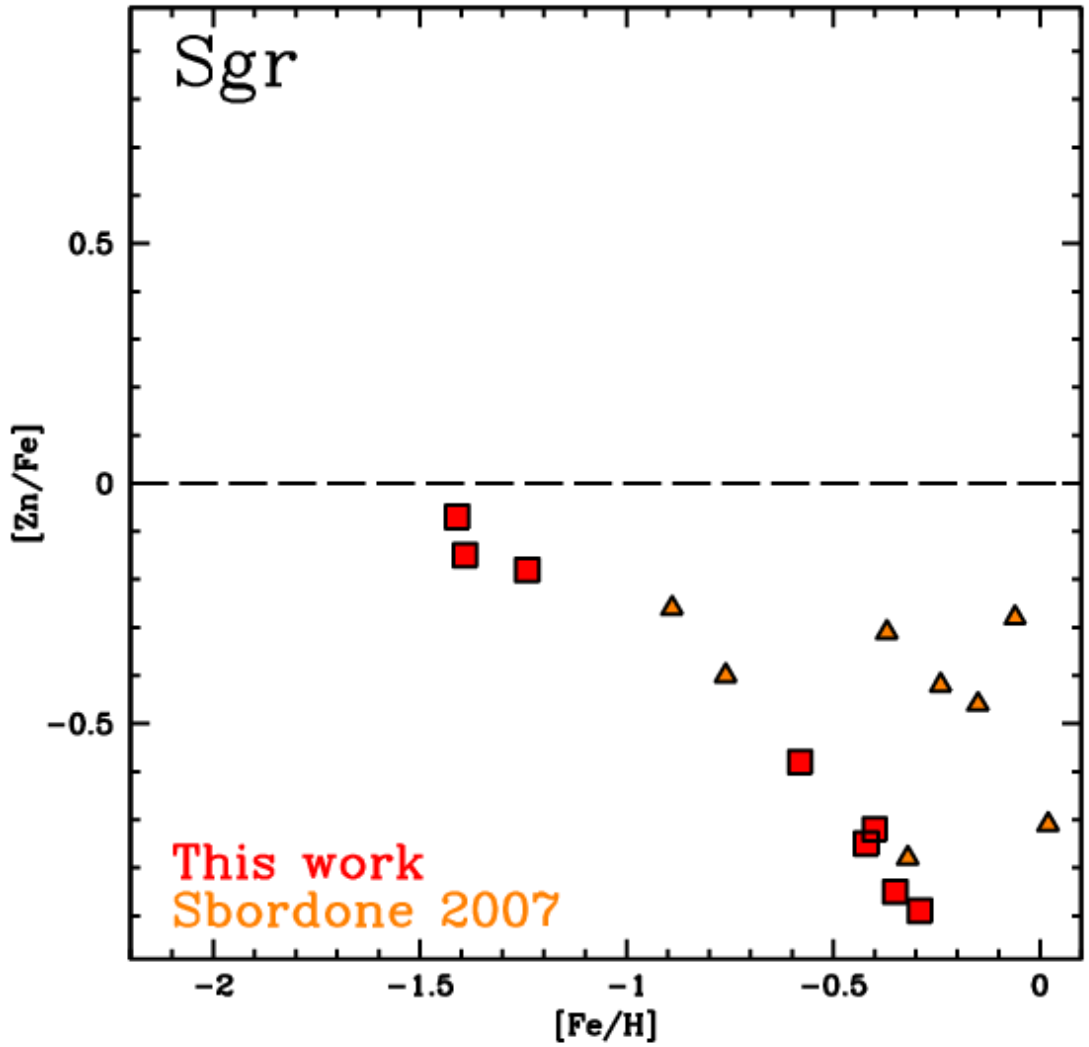
Ba





comparison with other work

Zn



r-process element: Eu