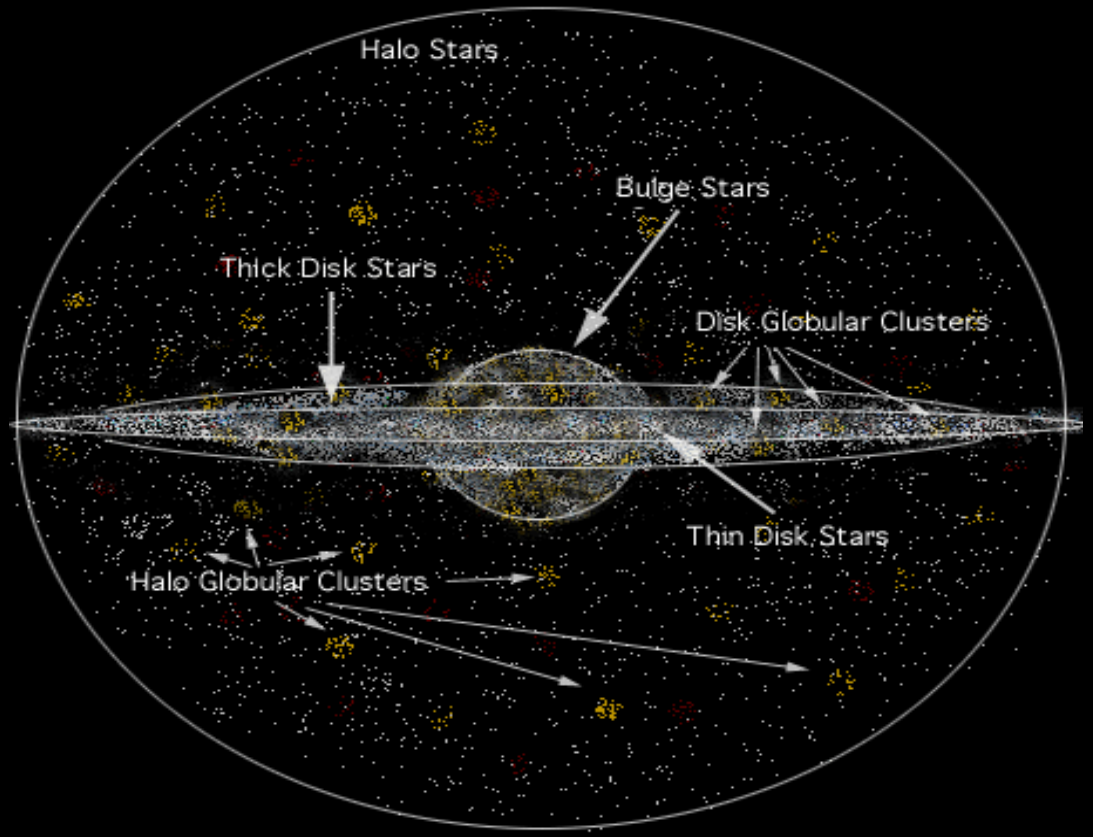
Precise magnesium abundances in the Galactic disk



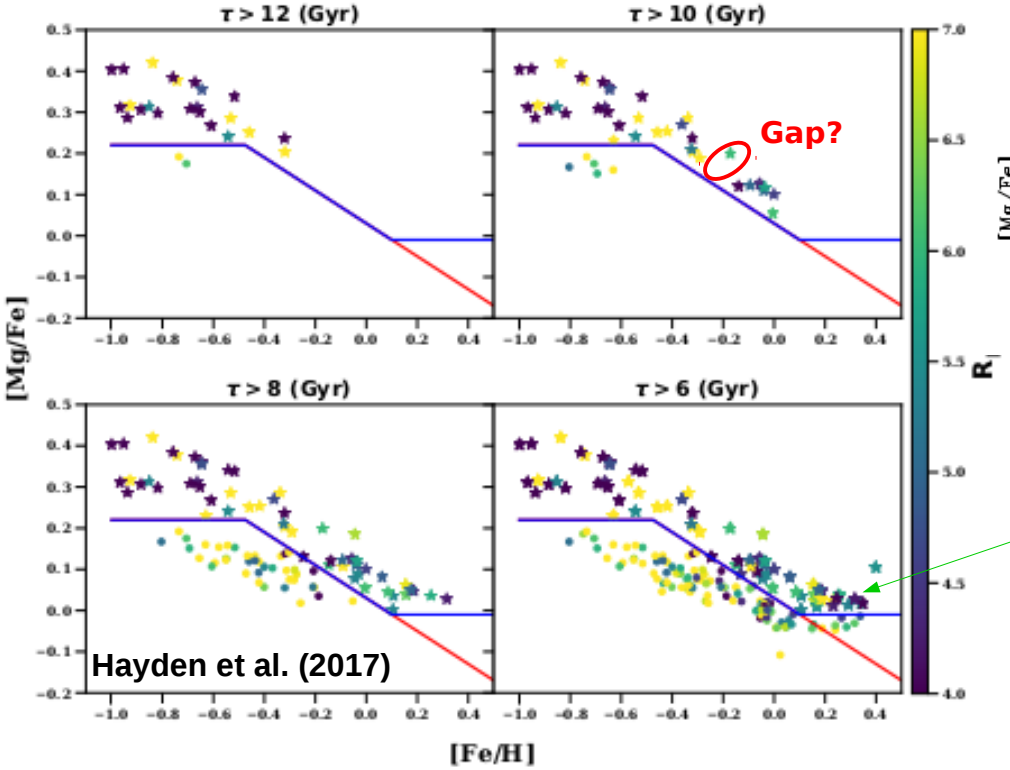
Graphic by Lucas Leslie, ESC, May 2000

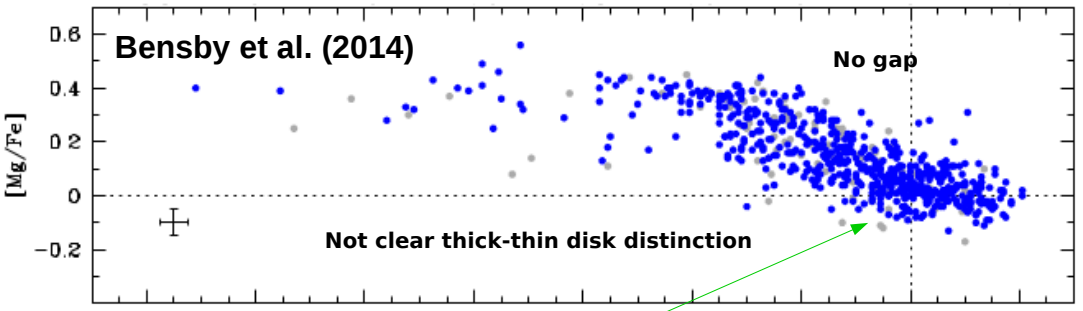
PhD: Pablo Santos del Peral

Supervisor: Alejandra Recio-Blanco

Aims & Methodology:

Goal: understanding the evolution of thin-thick disk populations from chemical abundances





¨Plateau?¨

The study of chemical signatures requires precise elemental abundances

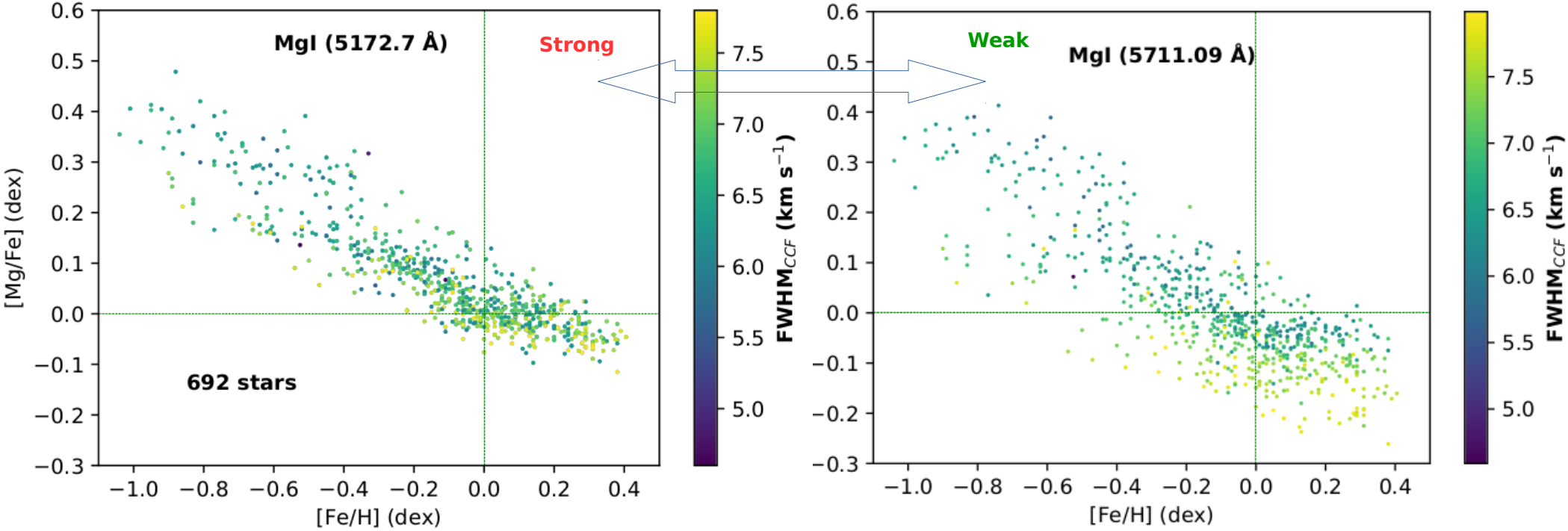
Sample: AMBRE:HARPS observational data (R ~ 115000) - 2210 stars - mostly dwarfs in solar neighborhood
(de Laverny et al. 2013 ; De Pascale et al. 2014)

Method: automatic spectral synthesis code GAUGUIN **(Bijaoui et al. 2012; Guiglion et al. 2016)**

		MgIb triplet							
Mg I (Å):	4730.04	5167.3	5172.7	5183.6	5528.4	5711.09	6318.7	6319.24	6319.49
					Strong	Weak			

Results: Importance of line selection

1. Different behavior and precision with the line intensity :

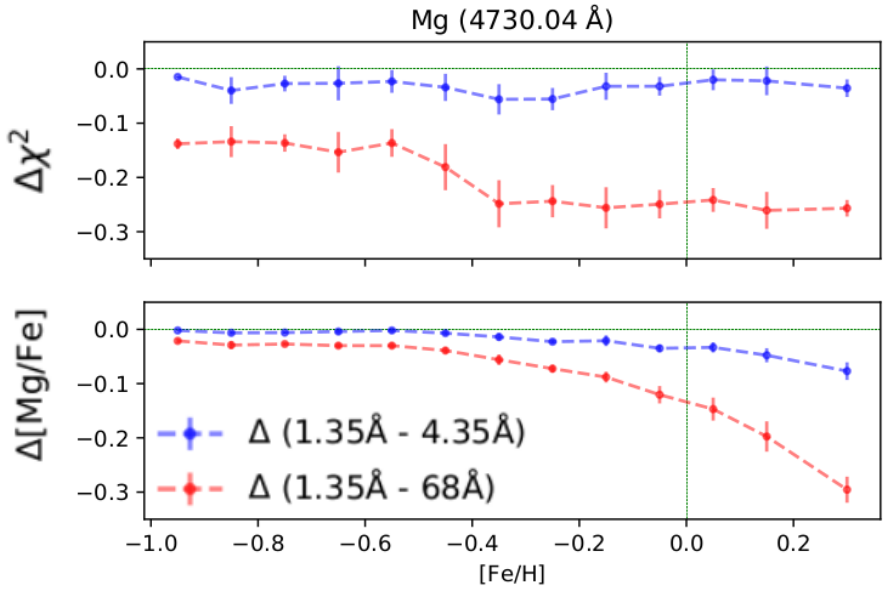


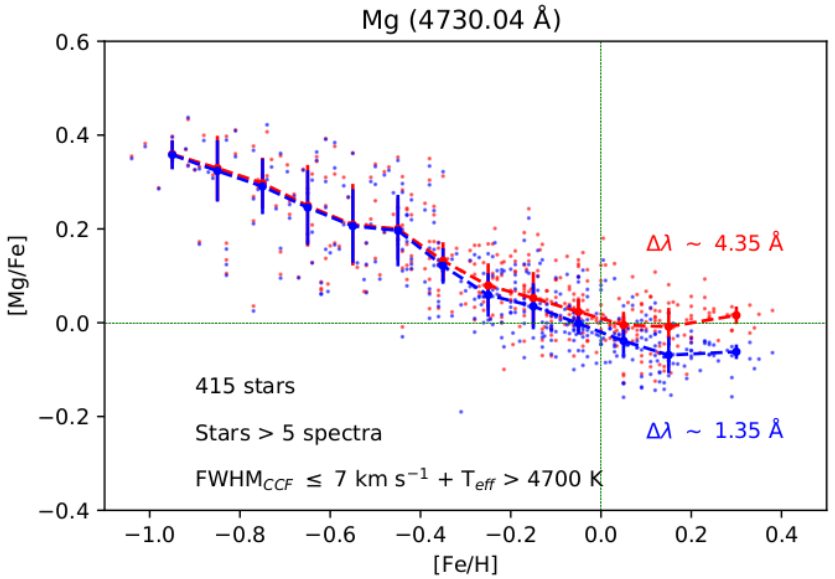
Strong lines are less sensitive to rotational velocity

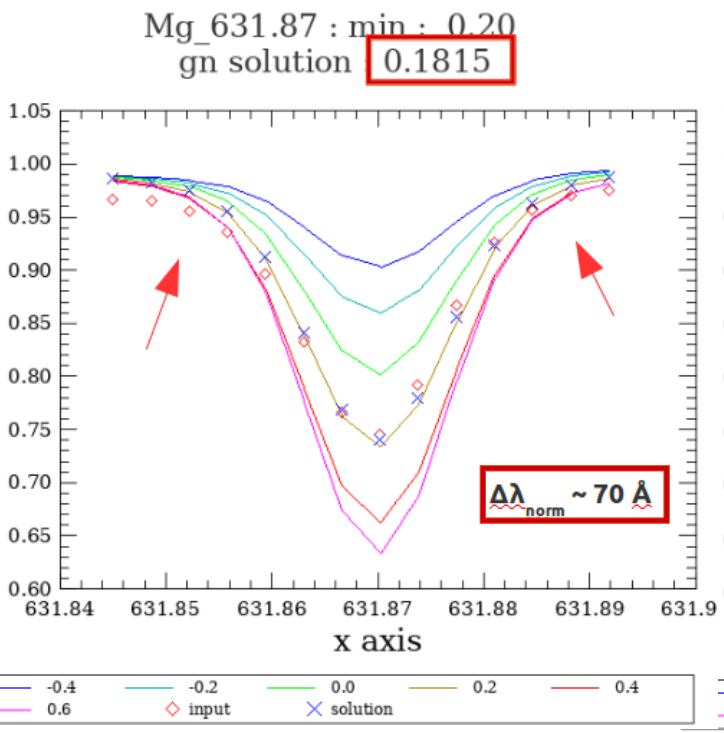
& present more precise thin-thick disk sequences

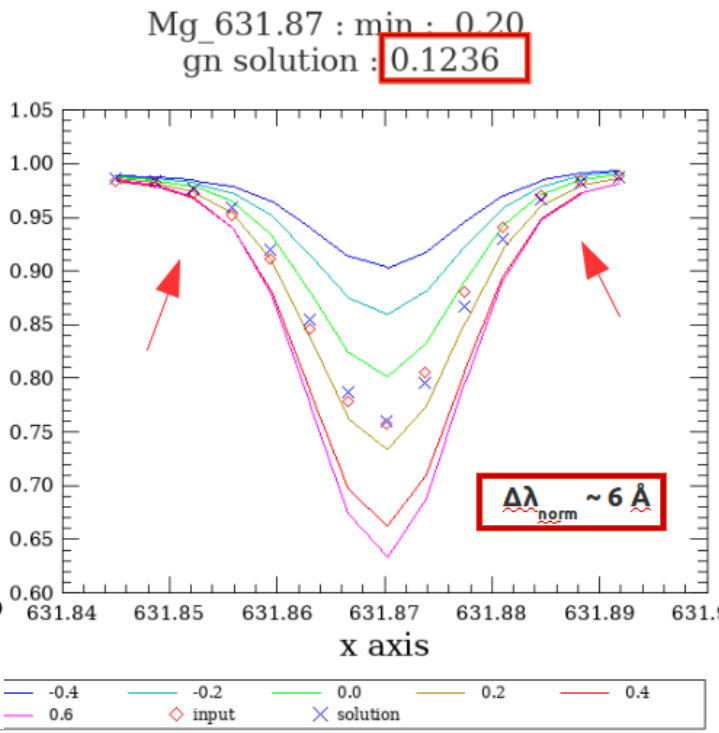
Results: Normalization problems

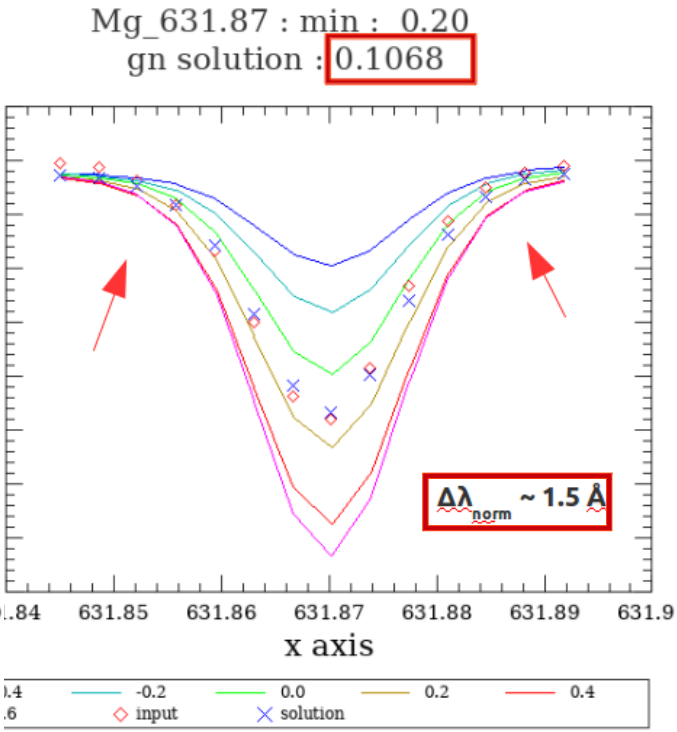
2. The choice of the local continuum placement has a direct impact on the abundance :



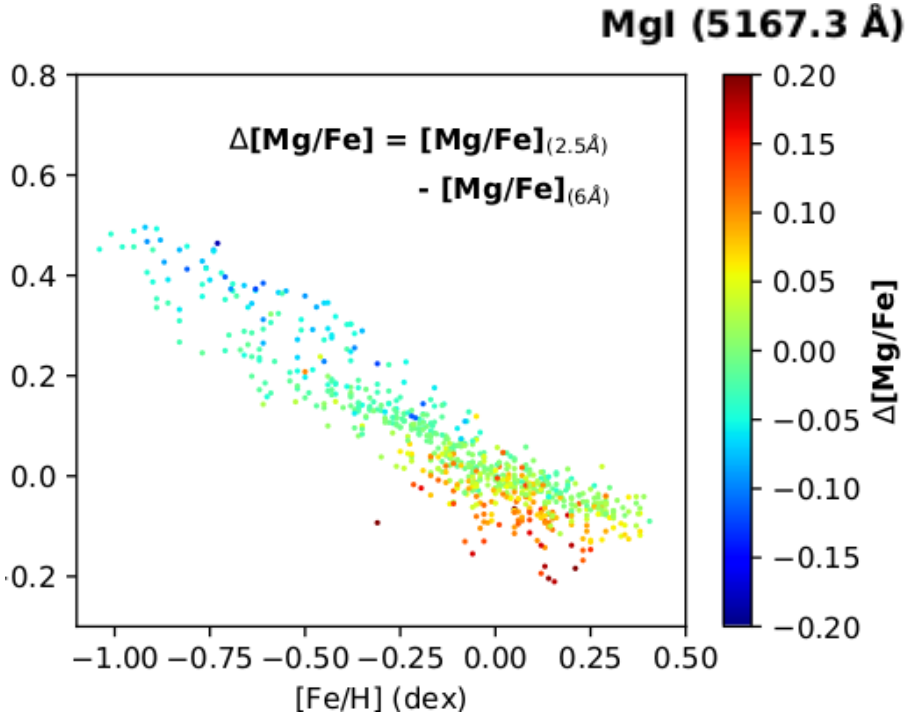


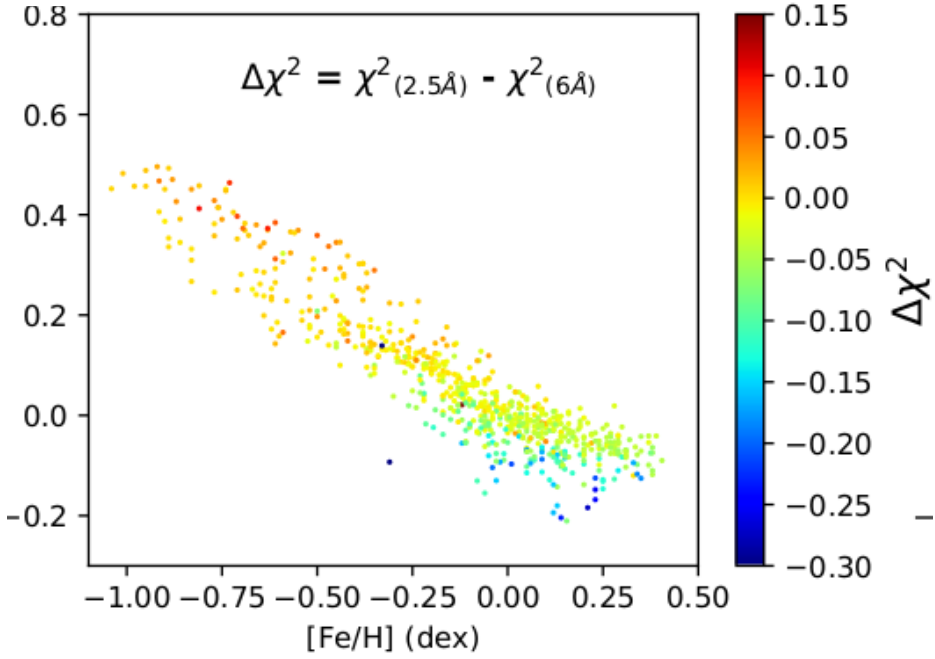




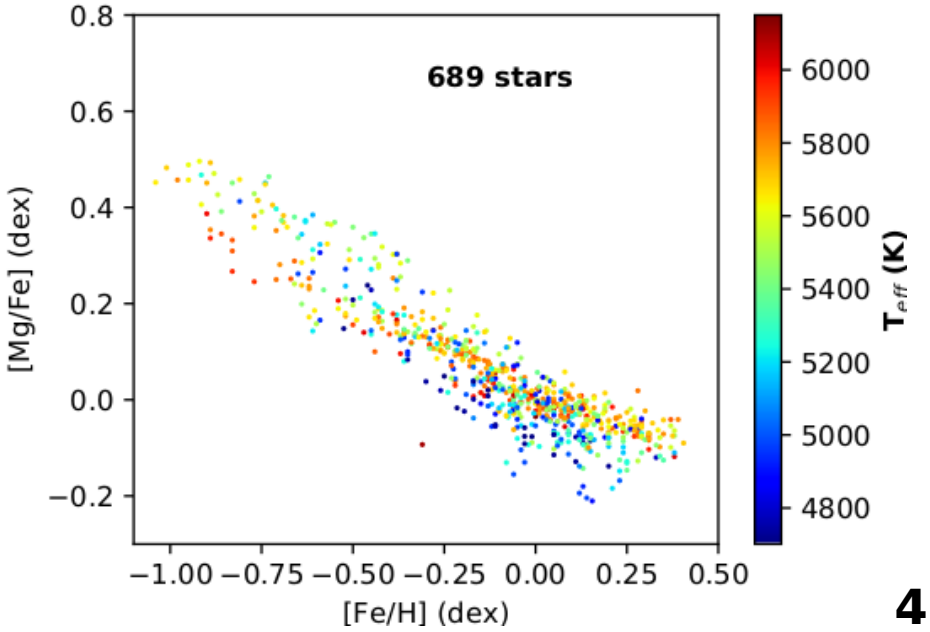


Results: Normalization problems

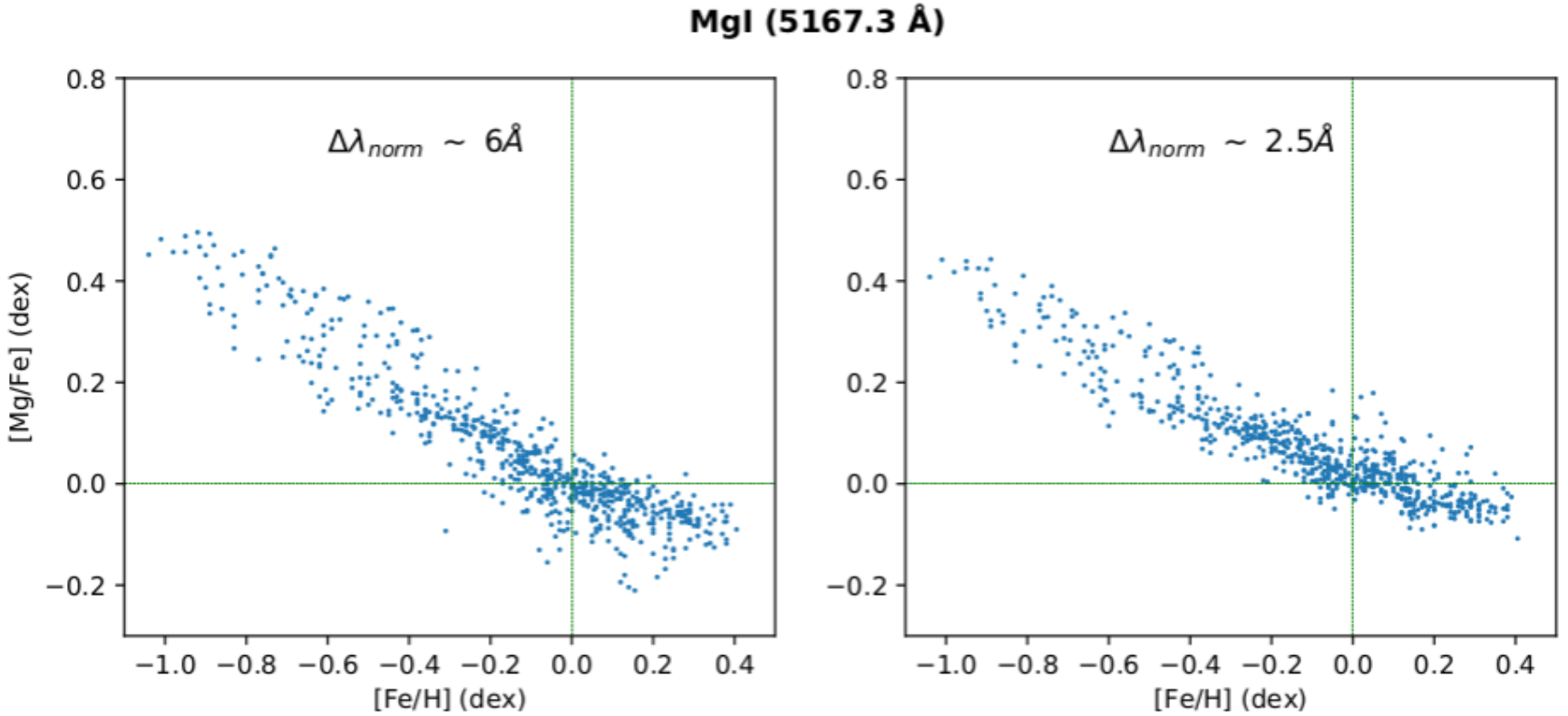




The normalization procedure needs to be optimized depending on the stellar type (Teff, [Fe/H])



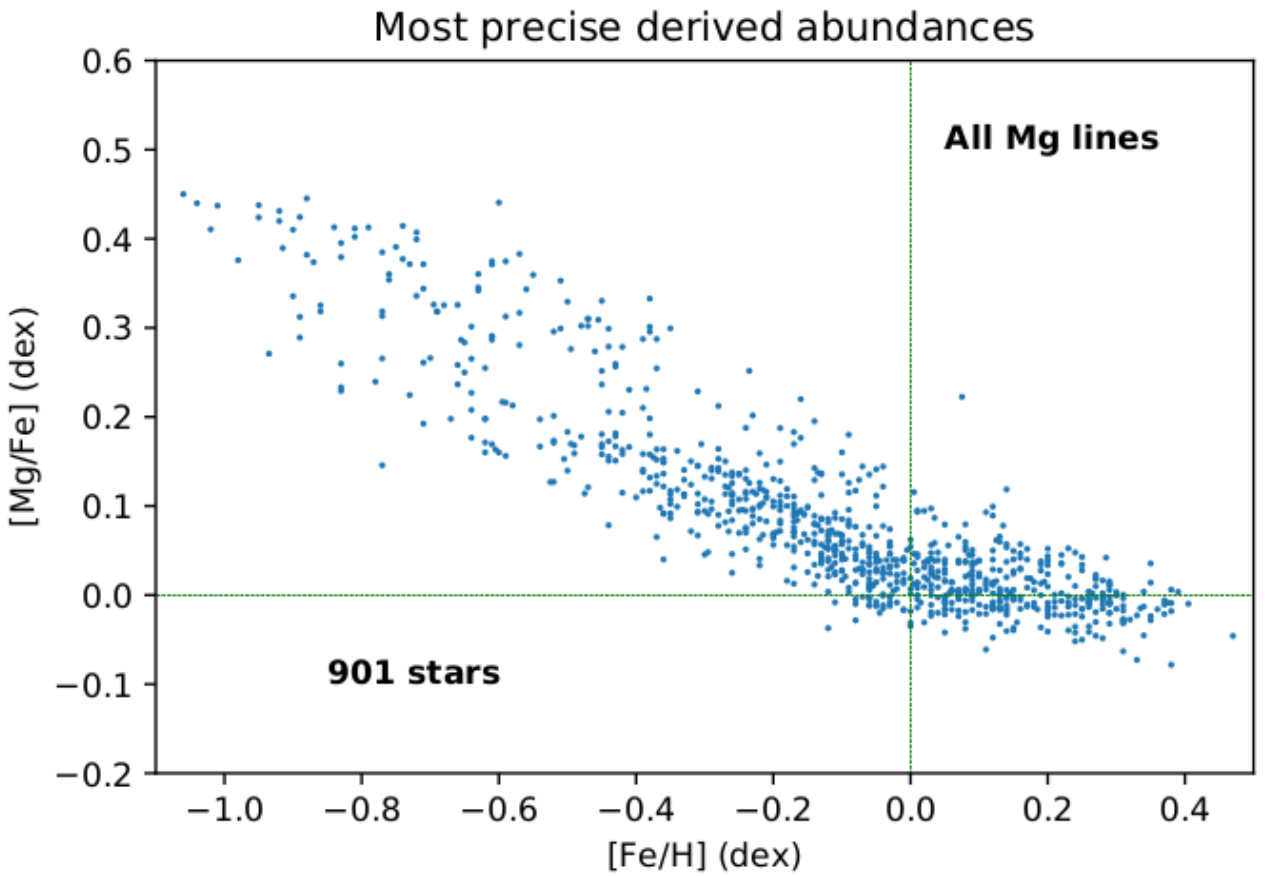
Results: Normalization problems



The normalization procedure needs to be optimized depending on the stellar type (Teff, [Fe/H])

Results: More precise Mg abundances in the Gaia era

Chemodynamical studies on the Galaxy are constrained by the abundance precision



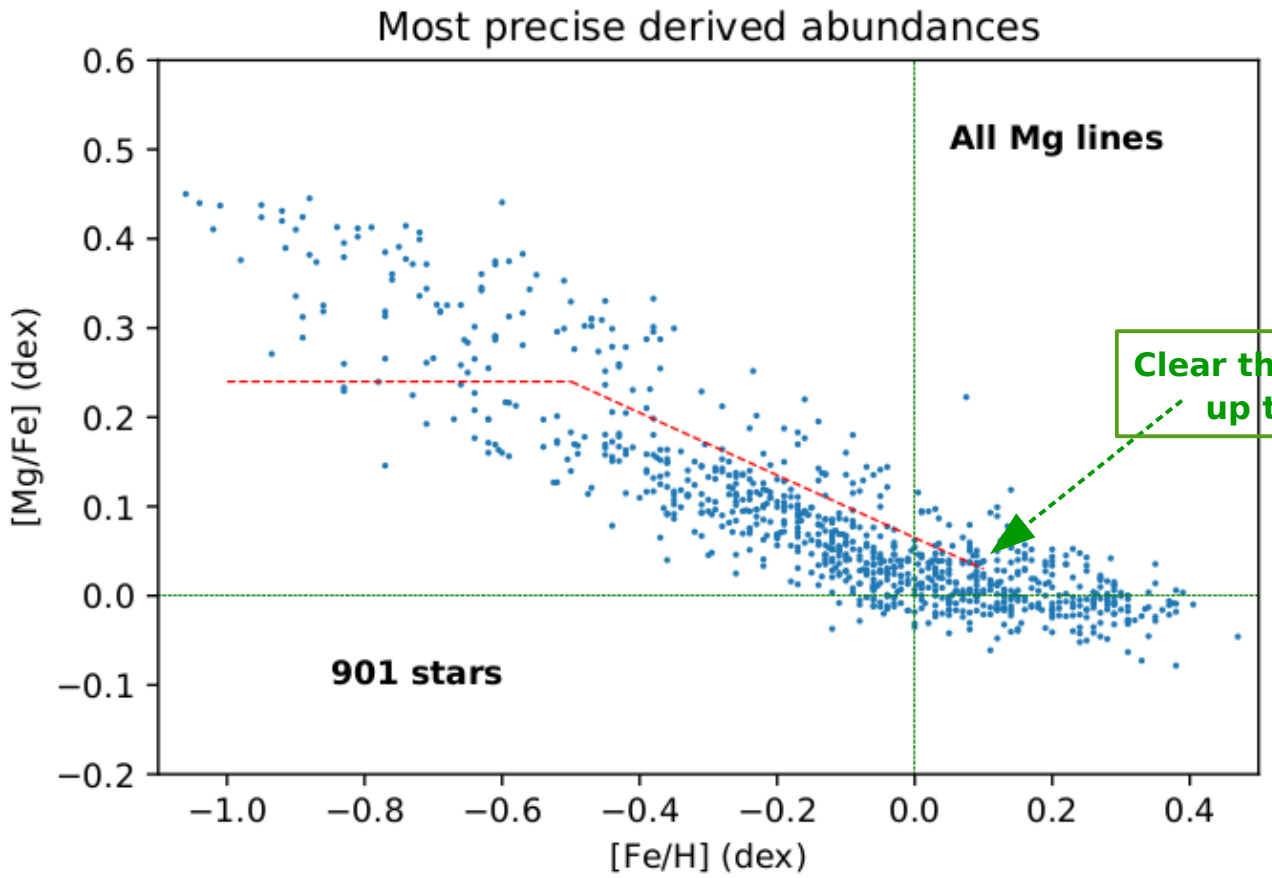
Precise chemical abundances + Gaia distances/kinematics (of different stellar populations)

⇓

light on chemodynamical relations (migrated stars contribution / thin-thick disk distinction)

Results: More precise Mg abundances in the Gaia era

Chemodynamical studies on the Galaxy are constrained by the abundance precision



Clear thick-thin disk distinction up to [Fe/H] ~ +0.1 dex

Precise chemical abundances + Gaia distances/kinematics (of different stellar populations)

⇓

light on chemodynamical relations (migrated stars contribution / thin-thick disk distinction)