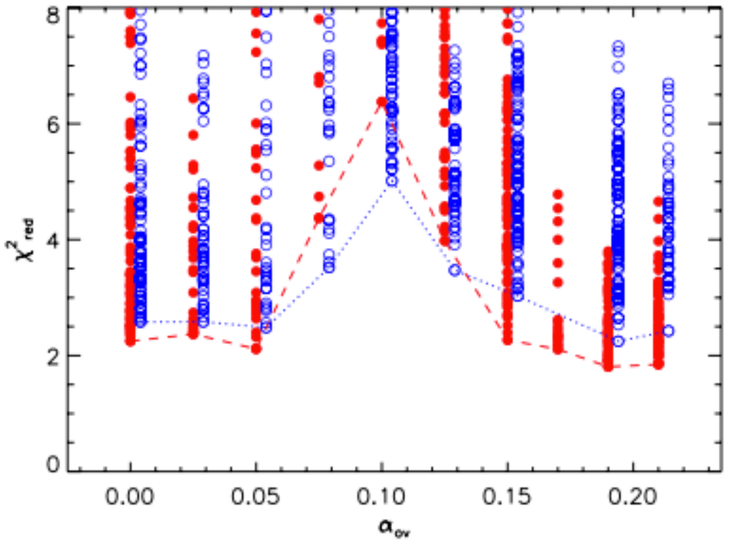
S03 - Subgiants & red giants with asteroseismic data

- **Objective 1:** To place **constraints on stellar physics** through detailed modeling using simultaneously **seismology** (mixed modes) + **interferometry** (precise radius)

  ⇒ Need **bright stars** with **excellent seismic data**

- For subgiants, this could be used to gain insight on the **extent of main-sequence convective cores** (which remains an open question in stellar physics). Ex. for CoRoT subgiant HD49385:



	AGS05	
	low α_{ov}	high α_{ov}
α_{ov}	$0.00^{+0.01}$	0.19 ± 0.01
$M/M_\odot$	1.264 ± 0.013	1.210 ± 0.021
Age (Gyr)	4.88 ± 0.11	5.10 ± 0.18
$R/R_\odot$	1.947 ± 0.007	1.917 ± 0.011
$T_{\rm eff}$ (K)	5940 ± 40	6080 ± 60
$\log g$	3.960 ± 0.002	3.954 ± 0.002
$\alpha_{\rm conv}$	0.52 ± 0.01	0.56 ± 0.03
Minimum $\chi^2_{\rm red}$	2.11	1.81

Deheuvels & Michel (2011)

S03 - Subgiants & red giants with asteroseismic data

- **Objective 2:** To **test so-called "seismic scaling relations"**, which provide estimates for stellar **masses**, **radii**, and **surface gravity** using global seismic parameters
  - By directly comparing **interferometric radii** to those obtained with seismic scaling relations
  - By comparing **masses and radii** resulting from **full seismic modeling** (using interferometric constraints) to those obtained with seismic scaling relations

⇒ Requires interferometric radii for stars with:

- different evolutionary stages (subgiant phase, red giant branch & core-He burning phase)
- different masses
- different metallicities

- **Choice of targets:** Subgiants & red giants from CoRoT, Kepler and TESS missions showing (i) good seismic data and (ii) large enough predicted angular diameter