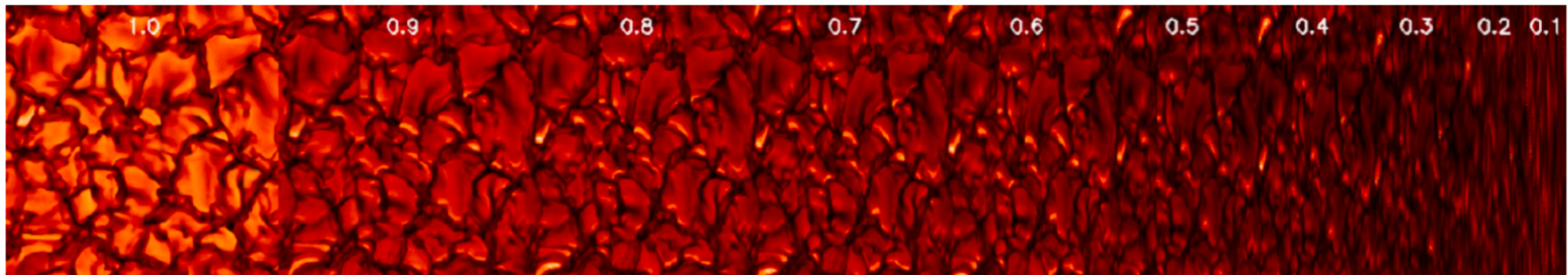


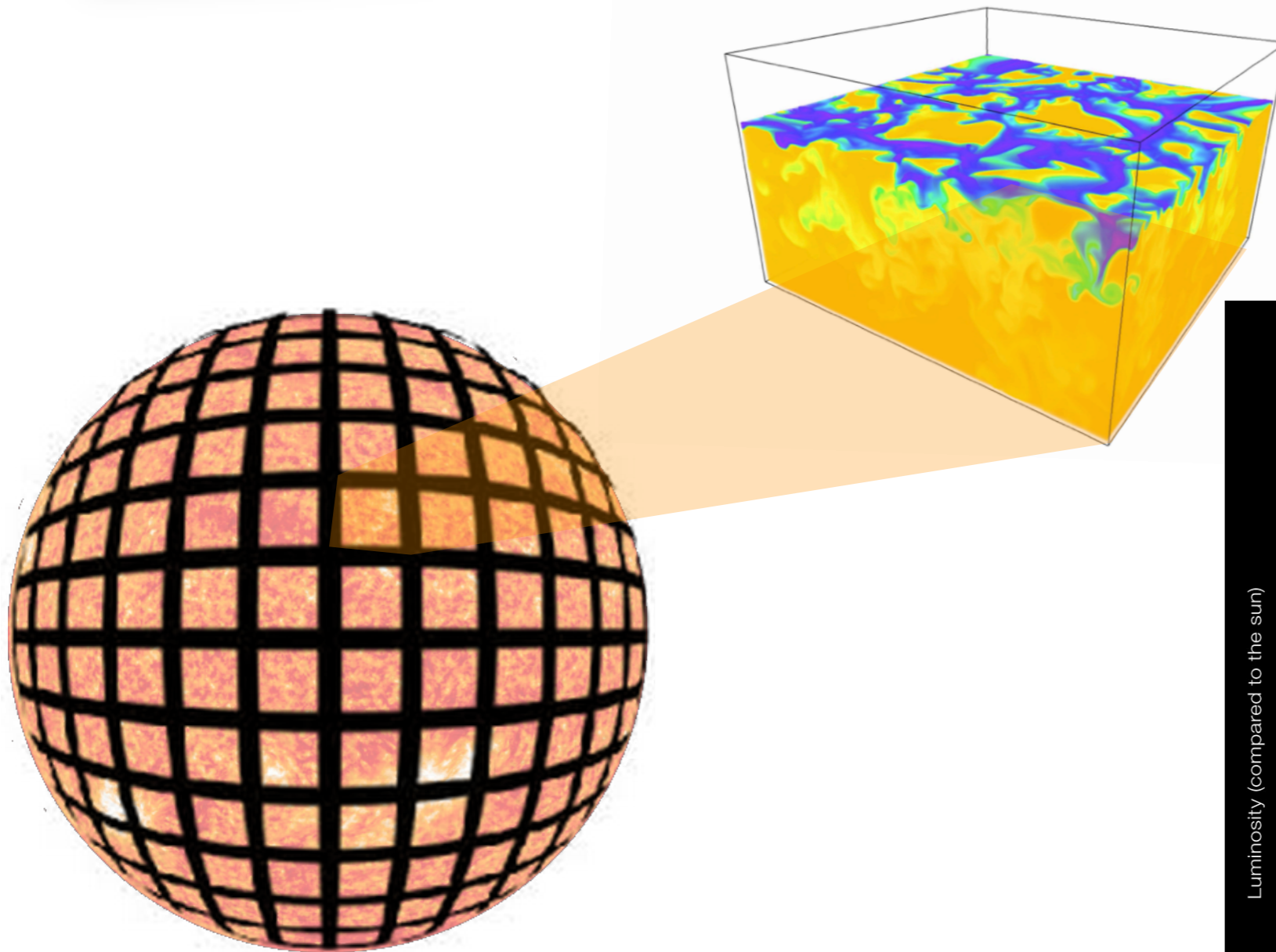
3D Simulations of stellar convection

A. Chiavassa & L. Bigot
Lagrange - Observatoire de la Côte d'Azur



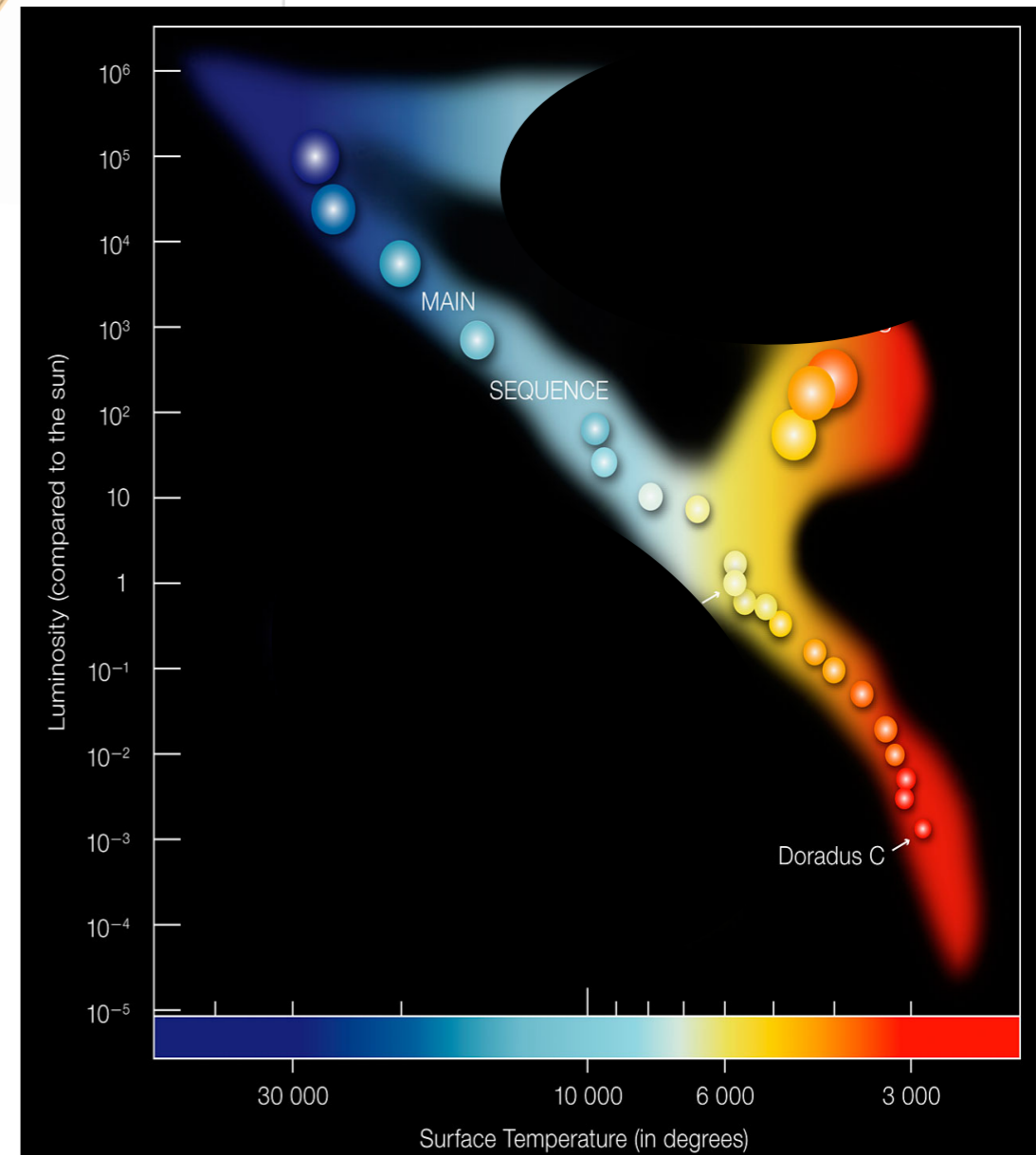
in collaboration with R. Collet, B. Freytag, R. Trempeaer, B. Plez, M. Asplund

3D RHD simulations of stellar atmosphere

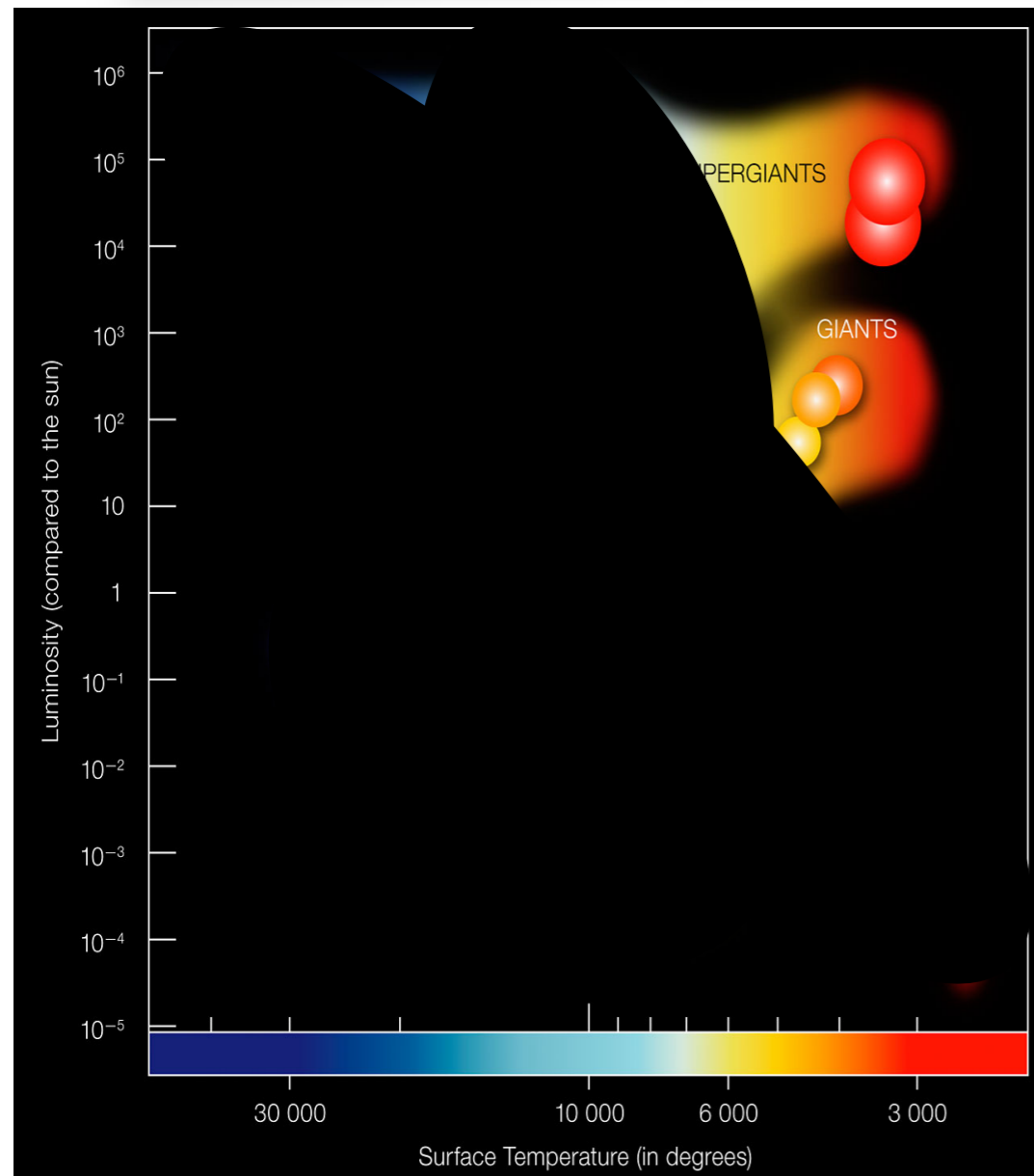


Stagger-Code (Nordlund et al. 2009, LRSP, 6;
Collet et al. 2011, A&A, 528)

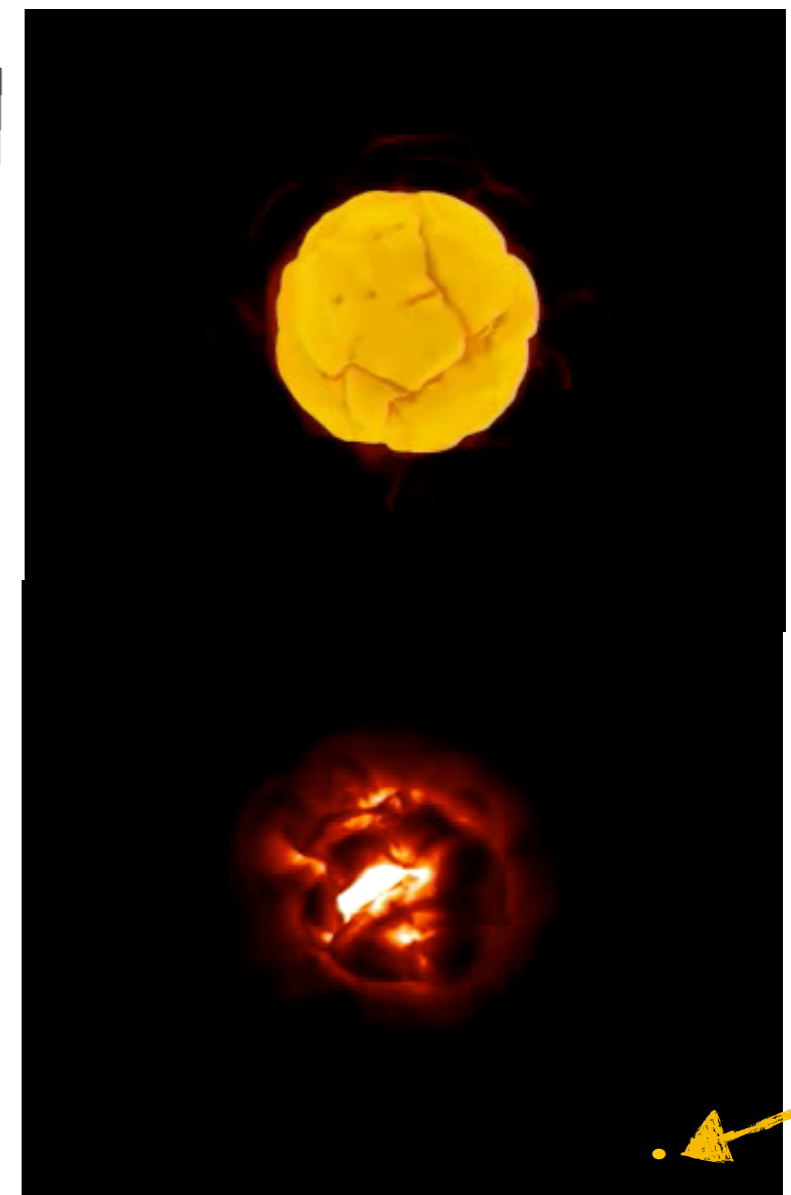
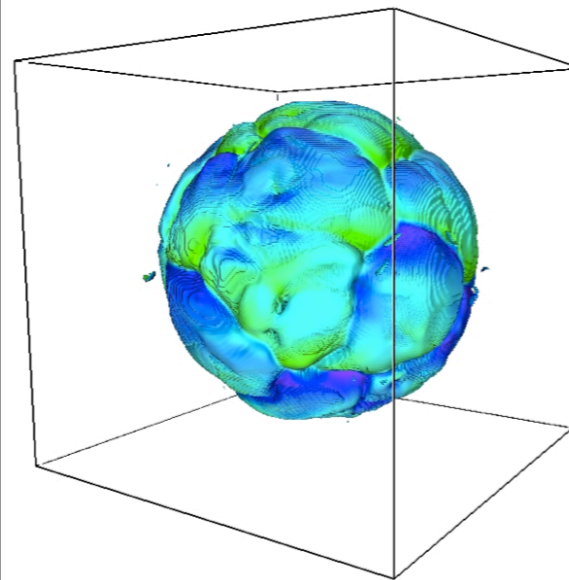
CO5BOLD (Freytag et al. 2012, JCP, 919)



3D RHD simulations of stellar atmosphere

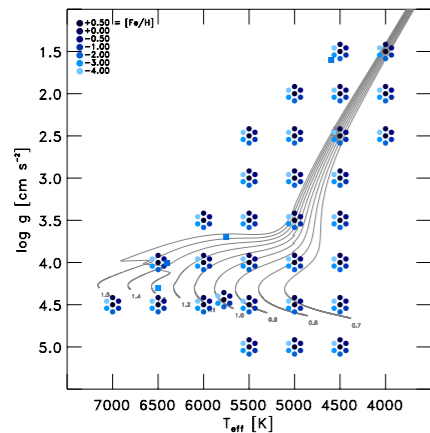


See M. Wittkowski's talk for evolved stars

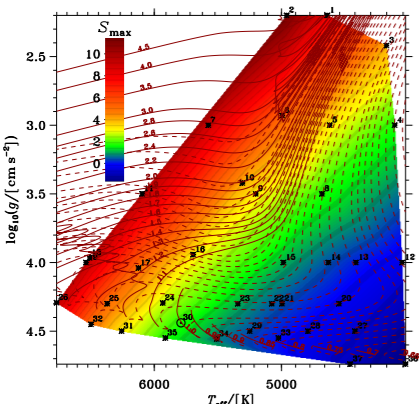


CO5BOLD (Freytag et al. 2012, JCP, 919)

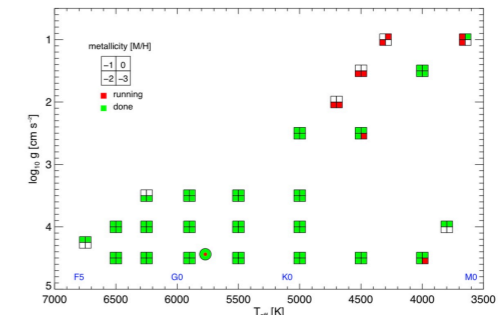
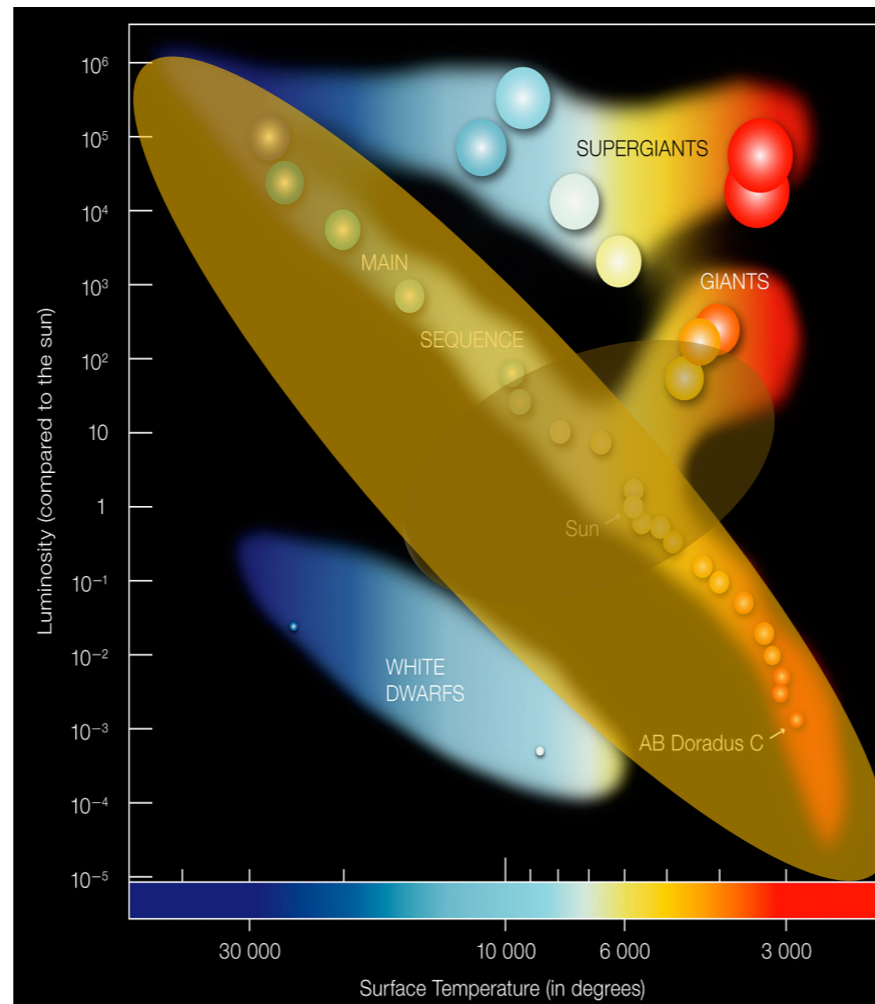
Grids available - different numerical schemes and similar physics



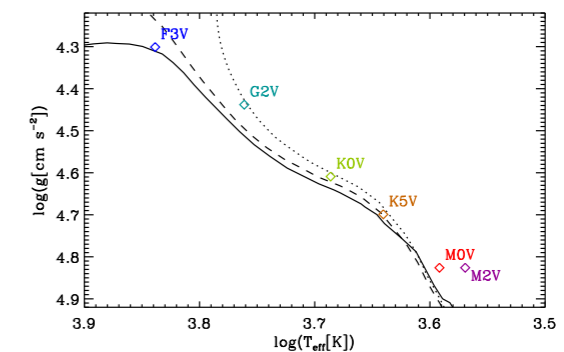
Magic et al. 2013, A&A - Stagger code or similar branches



Trampedach et al. 2013, ApJ - Stagger code or similar branches

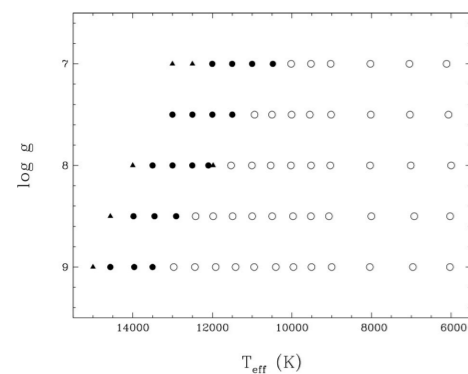


Ludwig et al. 2009, Memorie - CO5BOLD

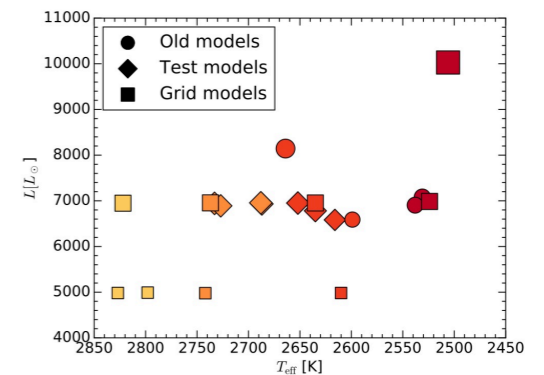
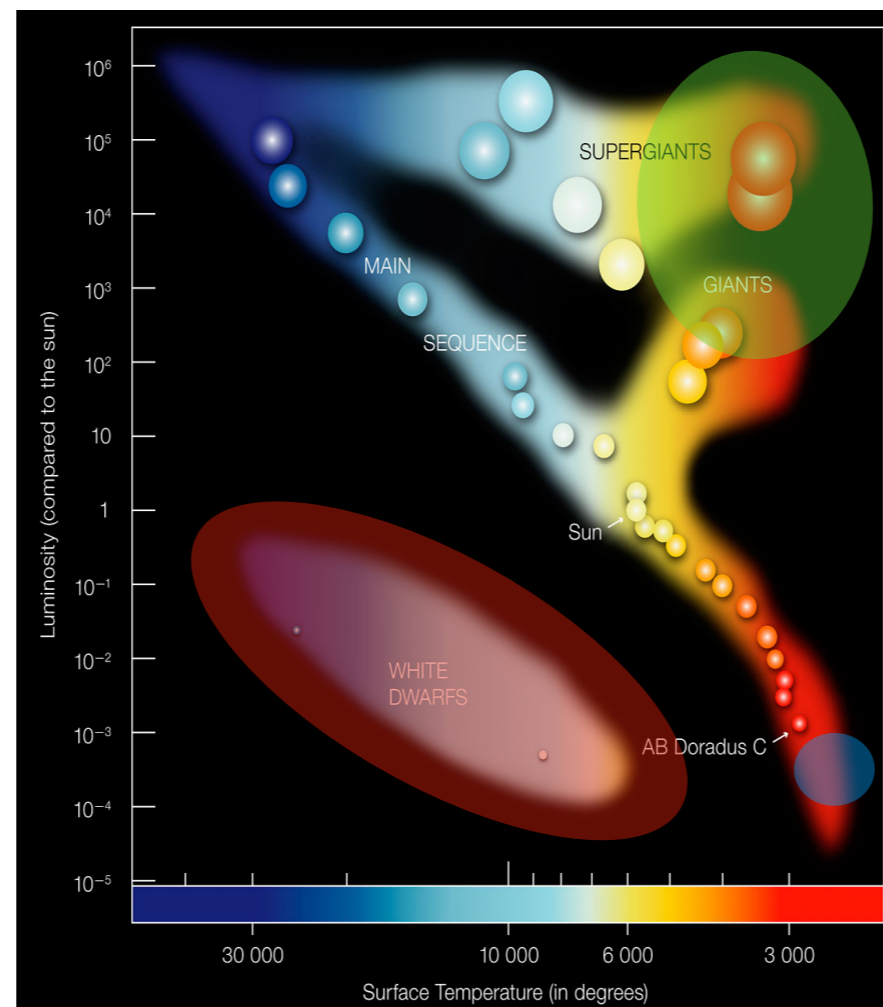


Beeck et al. 2013, A&A - MURaM

Grids available - different numerical schemes and similar physics



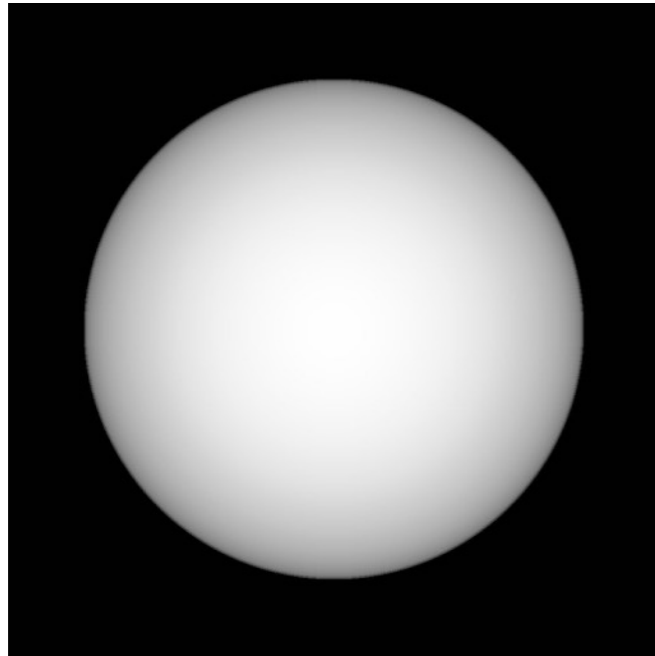
Tremblay et al. 2013, A&A - CO5BOLD



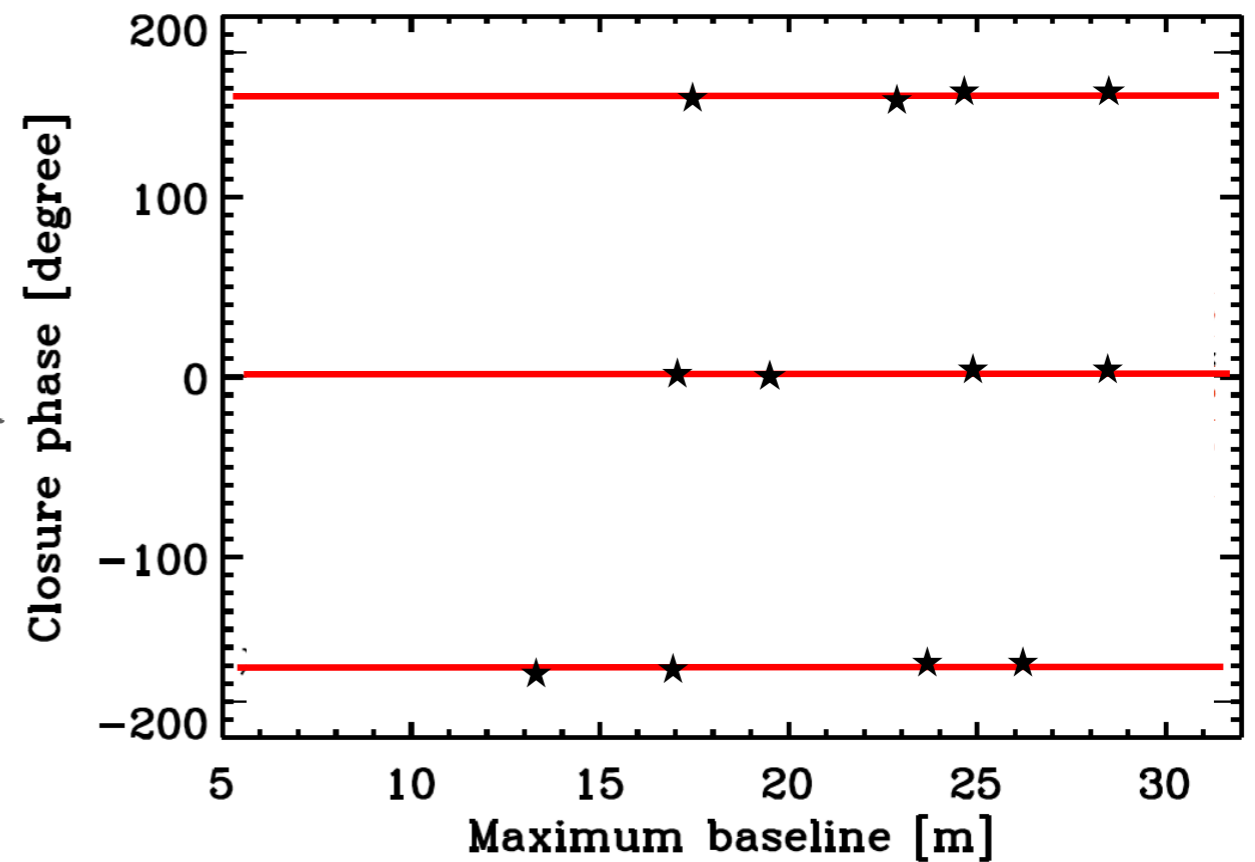
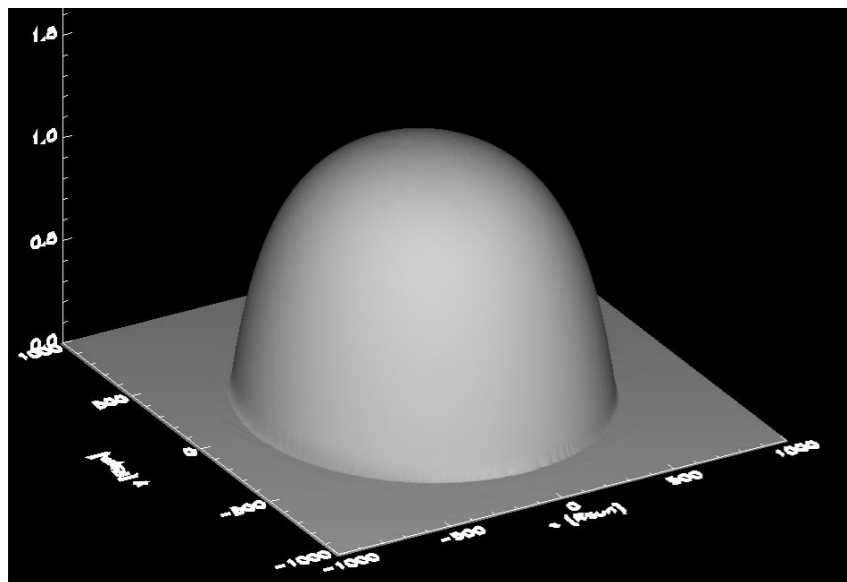
Chiavassa et al. 2011, A&A - RSG
 Freytag et al. 2017, A&A - AGB
 Vasilyev et al. 2017, A&A - Cepheids
 CO5BOLD

Wedemeyer et al. 2013 - M dwarfs
 Allard et al. 2013 - Brown dwarf
 CO5BOLD

Stellar granulation with closure phases

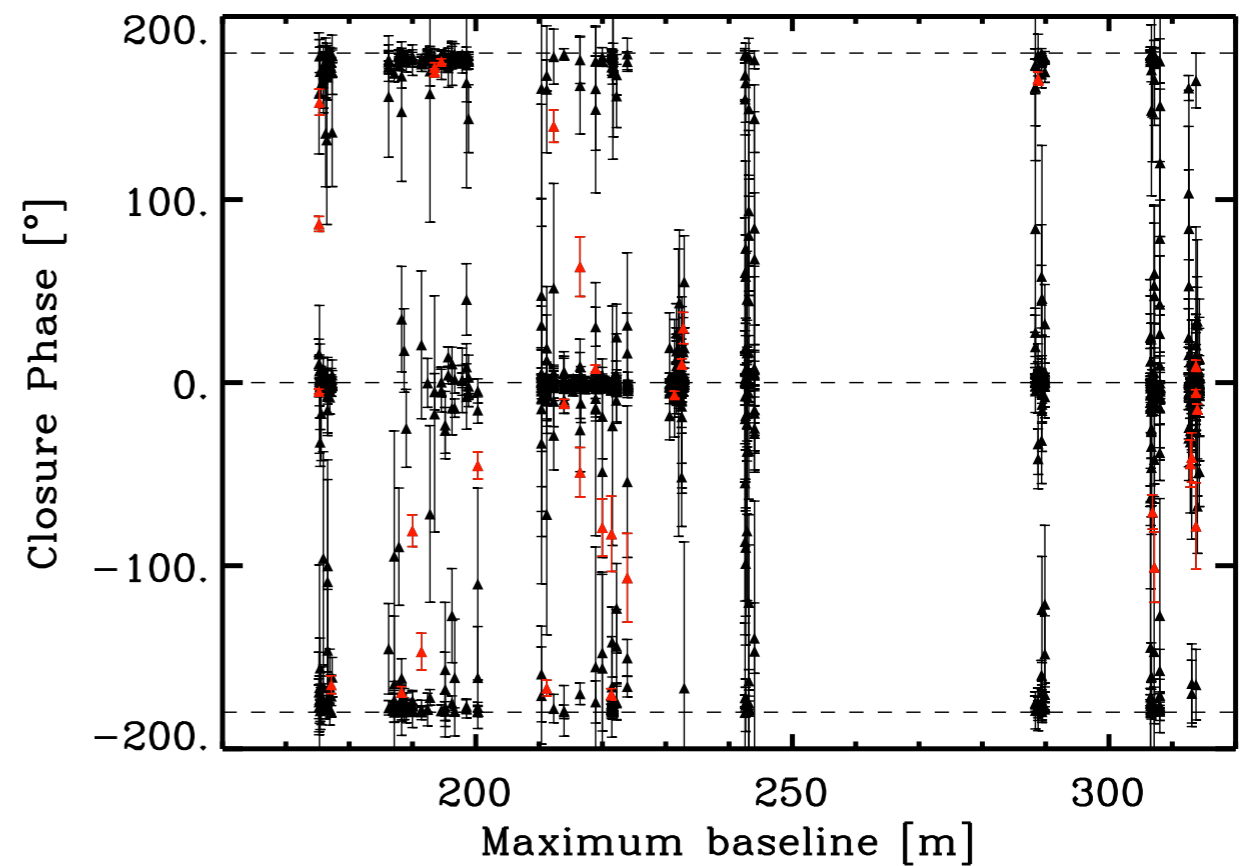
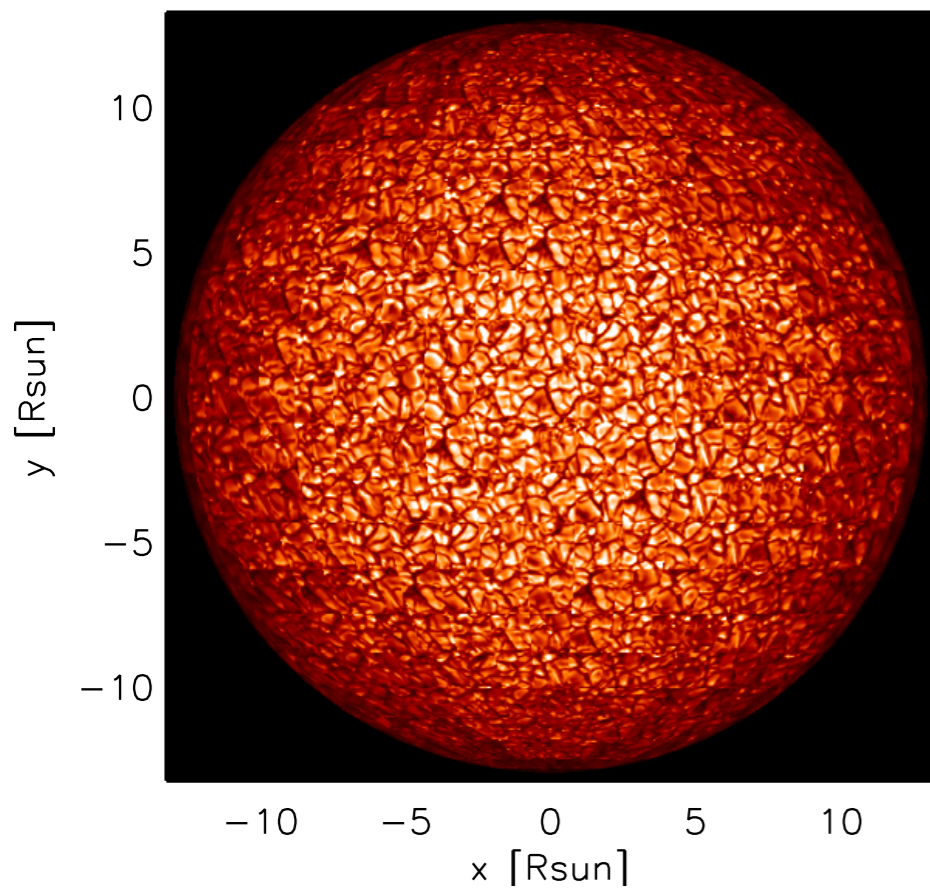


Limb darkened stellar disk



Stellar granulation with closure phases

synthetic K giant star

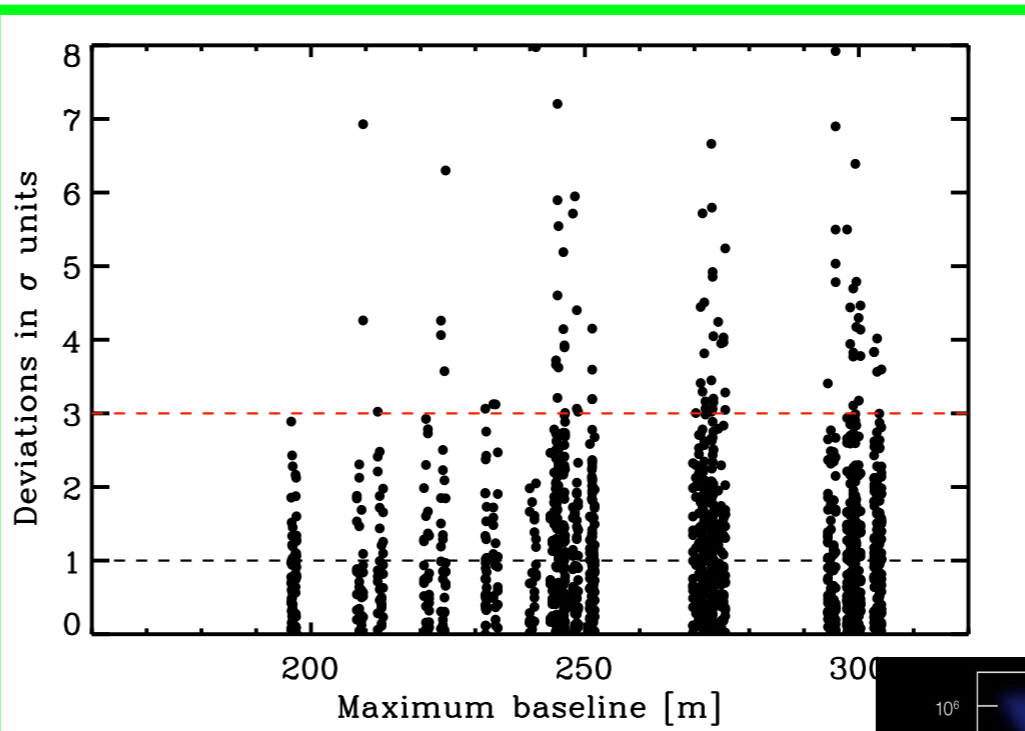


Data with error bars, MIRC@CHARA

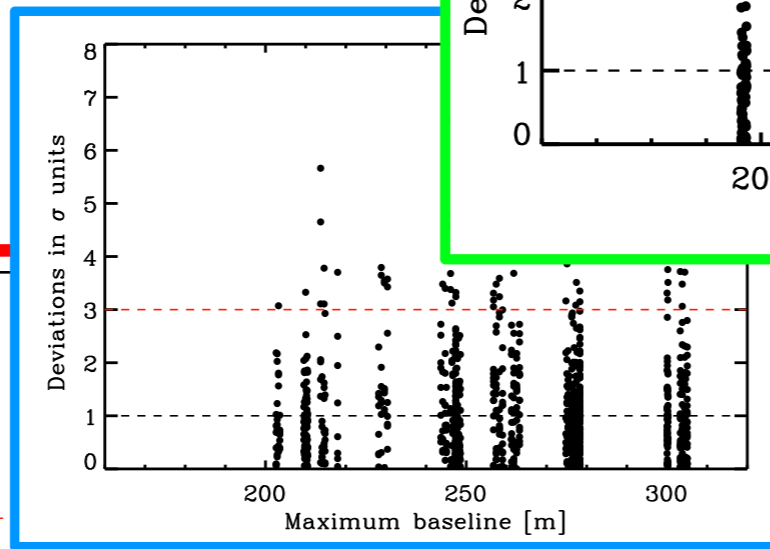
Departures larger than 3σ

Stellar granulation with closure phases

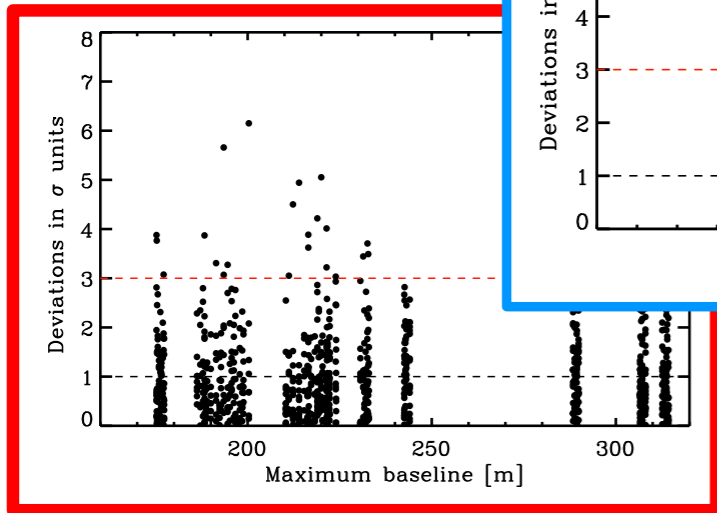
Closure phase departures
correlated with surface gravity



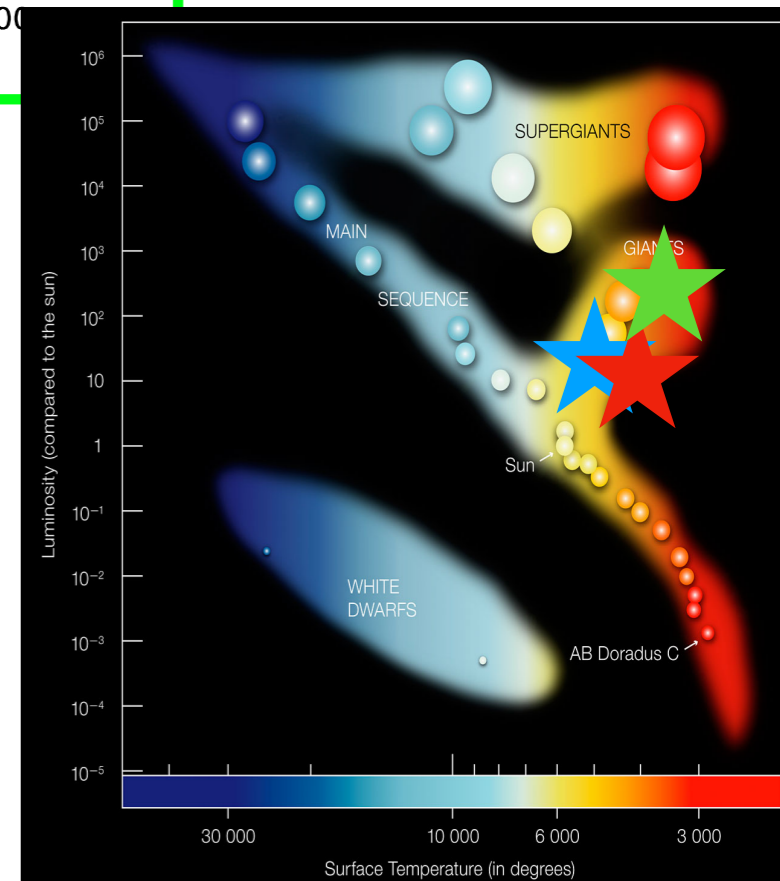
$\text{Log}(g) = 1.70$
6.3 % of point
higher than 3σ



$\text{Log}(g) = 2.62$
6.6 % of point
higher than 3σ



$\text{Log}(g) = 2.42$
3.6 % of point
higher than 3σ



END