IAU Symposium 268
Discussion A

What is the local value of D ?
How can we explain the dispersion of extragalactic D values ?

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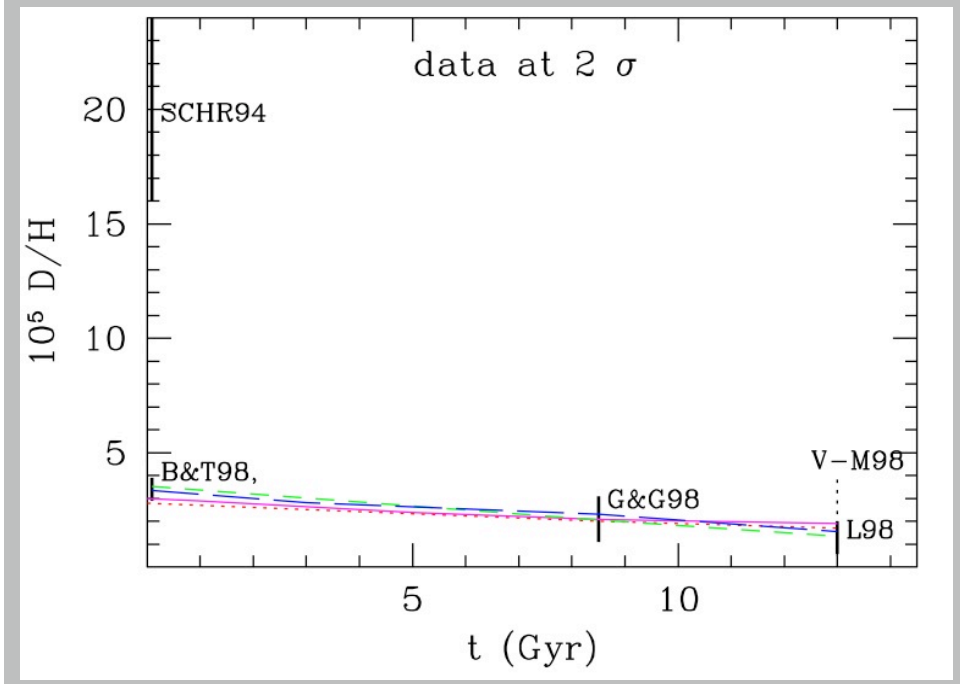
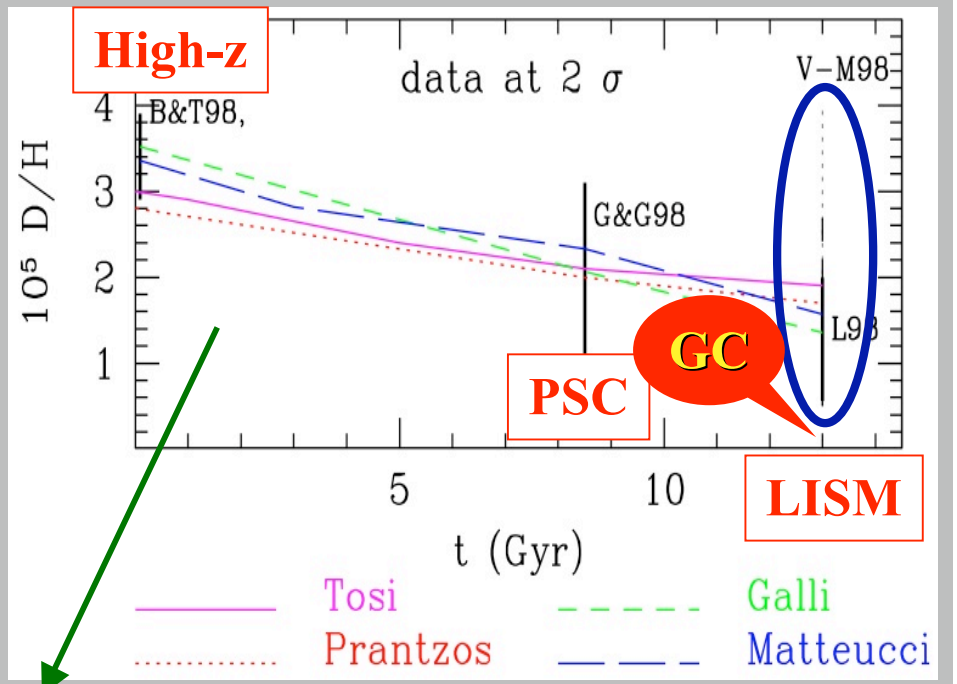
Observational situation at IAU 198 (Natal 1999)

Diffused optimism following also ISSI meeting in 1997

(see Burles&Tytler 98, Geiss&Gloeckler 98, Linsky 98, but also Vidal-Madjar et al 98)





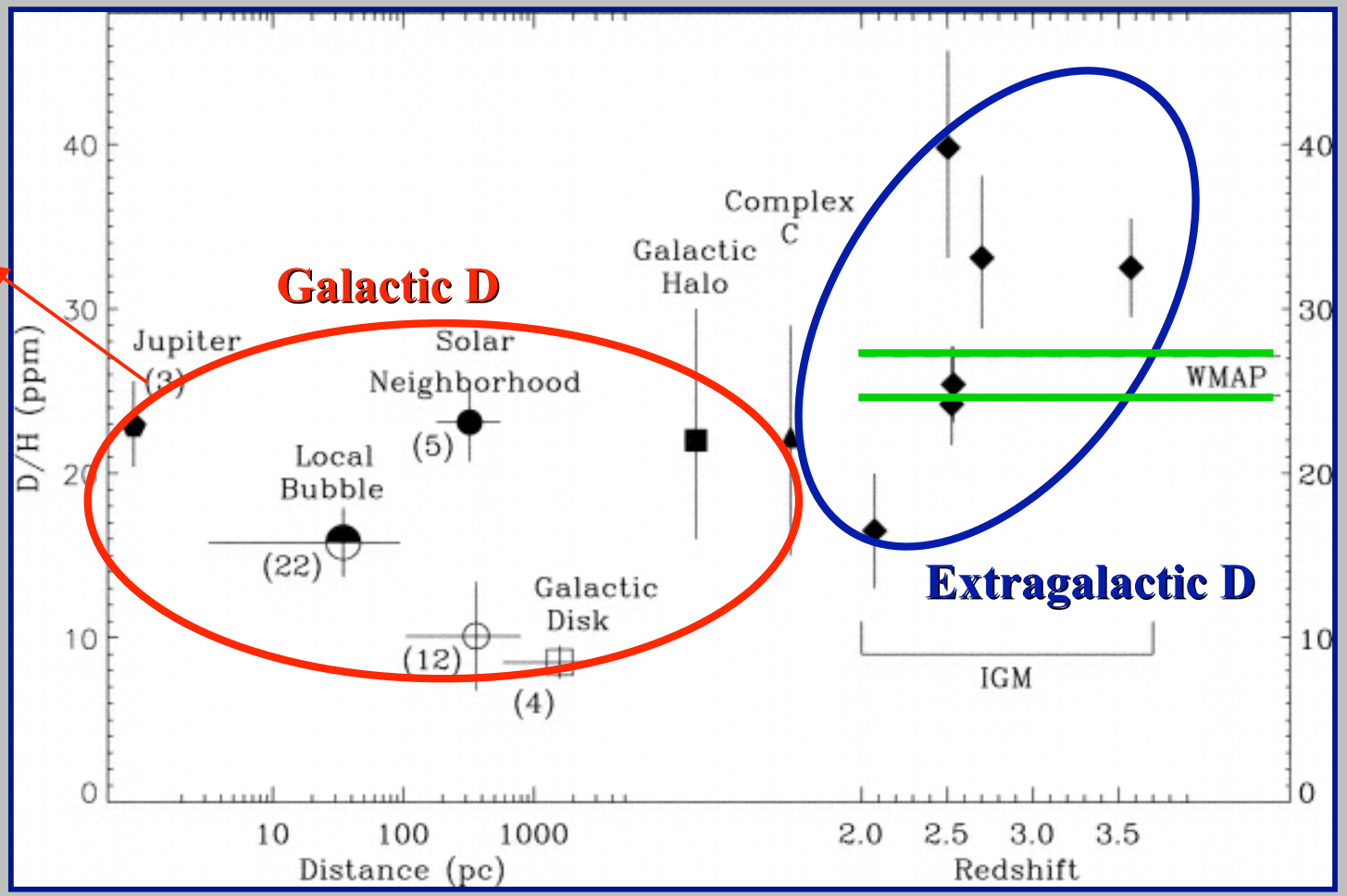
Vertical solid bars correspond to observed D/H at 2 sigmas in high-z clouds, PSC and LIC; dashed/dotted to claimed range in LISM

Coloured lines to "best" chemical evolution models for the solar neighbourhood from different groups (Tosi 2000)

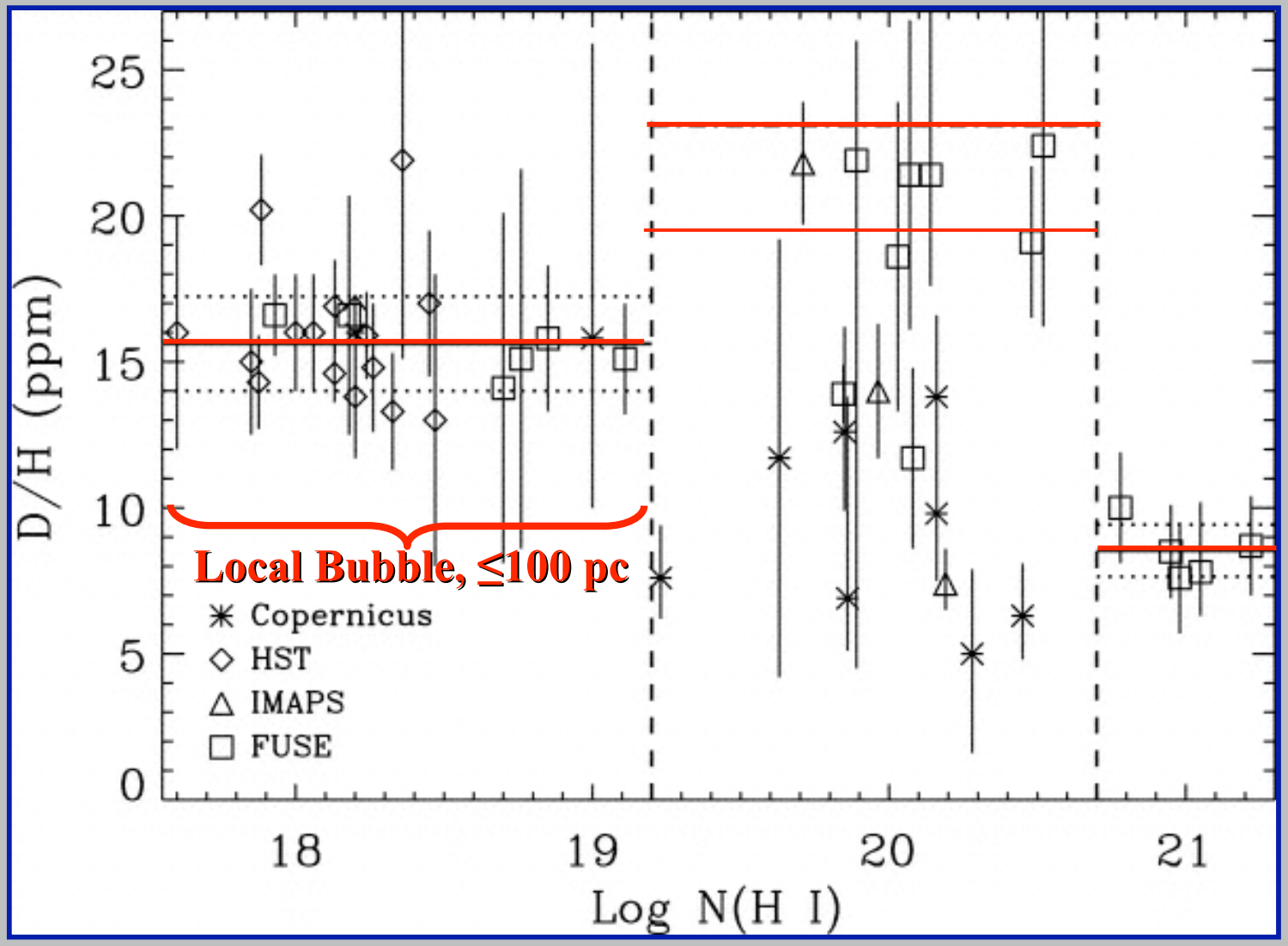
Observational situation

From Savage et al. (2007)

Numbers in parenthesis give the number of individual observations contributing to the plotted average



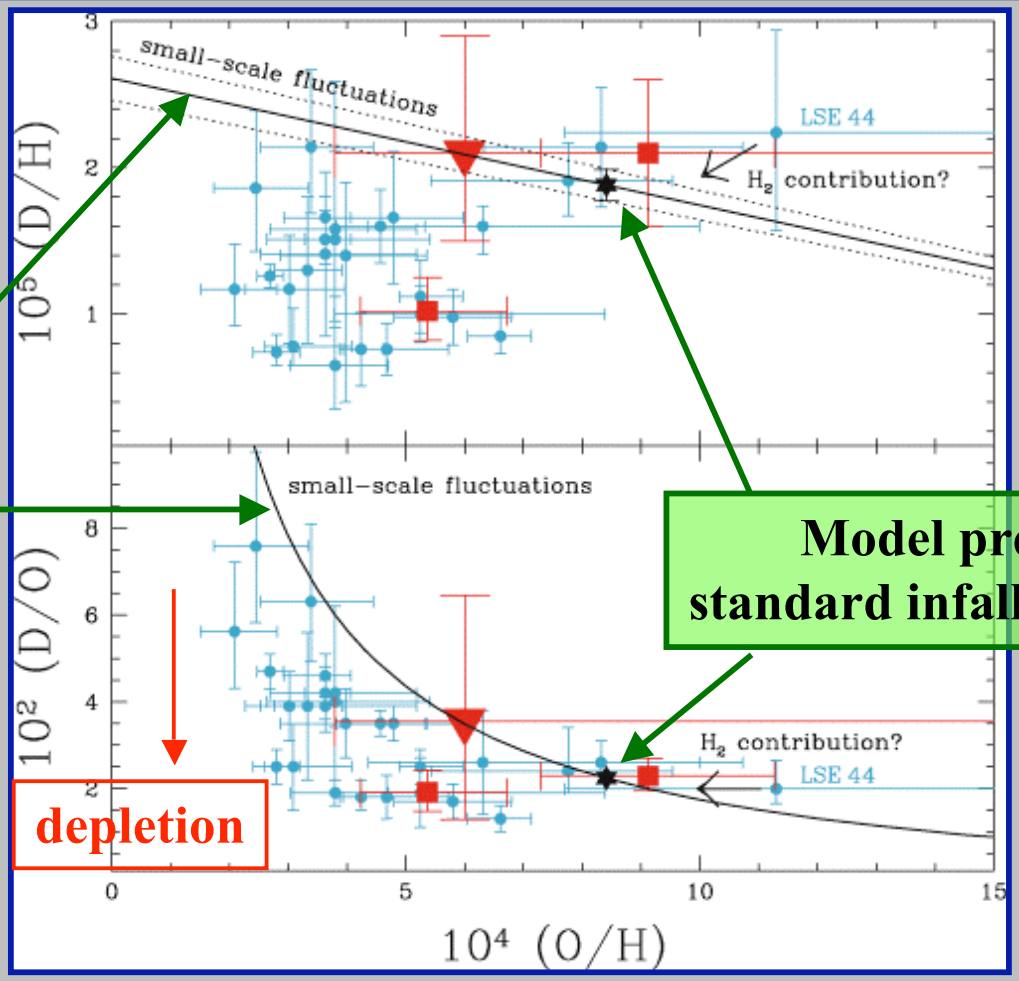
Local ISM



From Linsky et al (2006)

$D/H_{LISM} < 20$ ppm are consistent with chemical evolution models for the solar neighbourhood, when proper infall and depletion are taken into account

Solid line shows effect of infall small-scale fluctuations

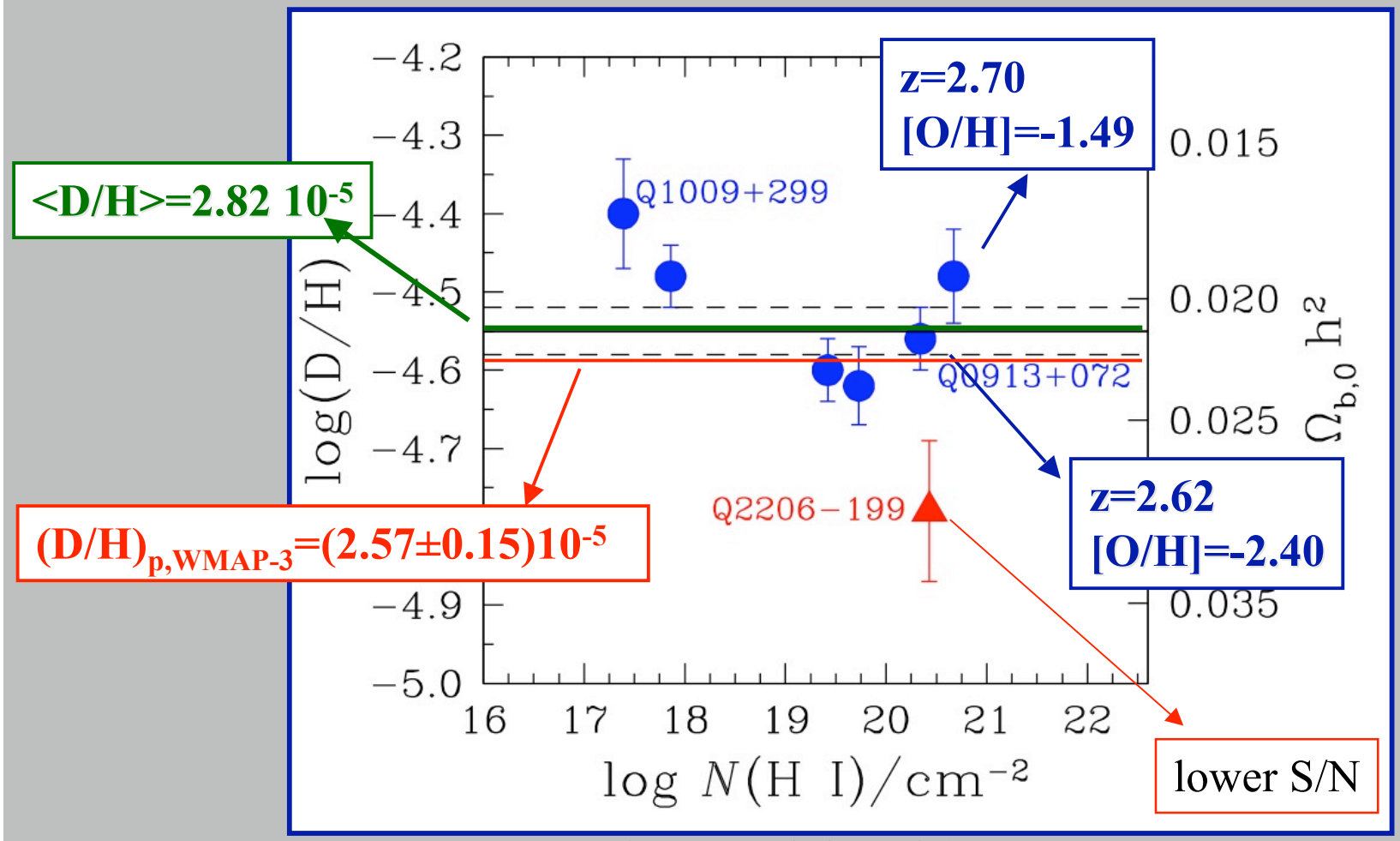


Model prediction with standard infall and no depletion

NB: models able to reproduce the vast majority of the observed properties of the whole Galaxy disk

from Steigman et al (2007)

High-redshift deuterium: current observational situation



from Pettini et al (2008),
see also O'Meara (2006)

Discussion on deuterium

What is the local value of D ?

23±2.4 ppm (Linsky 06), 19±2.4 ppm (Steigman 07), 9.8±1.9 ppm (Hébrard 05), else ?

Can it be taken as representative of the whole Galaxy ?

Clearly not, given the very different values found elsewhere

What future observations of D or other species might help resolve the issue ?

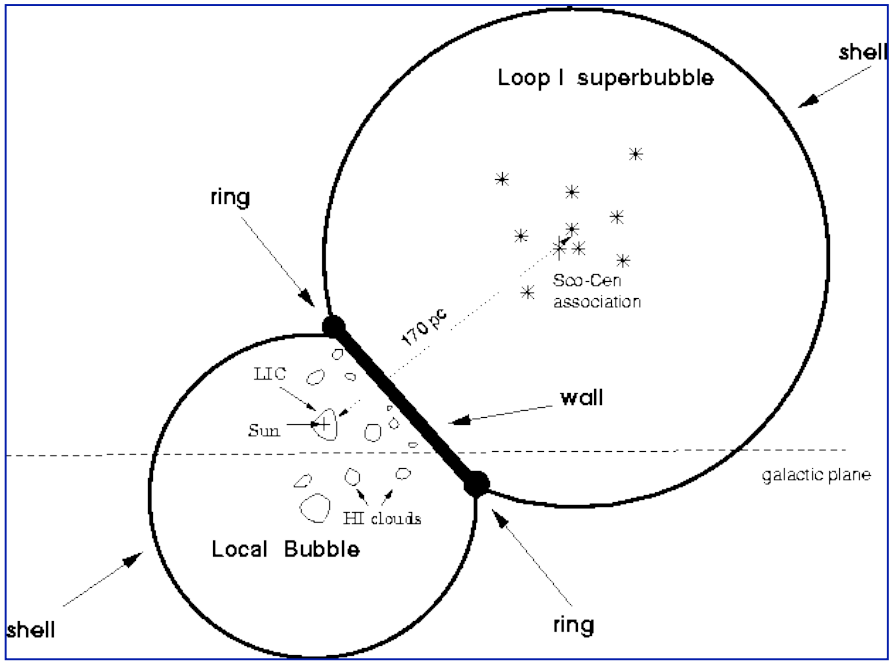
How can we explain the dispersion of extragalactic D values ?

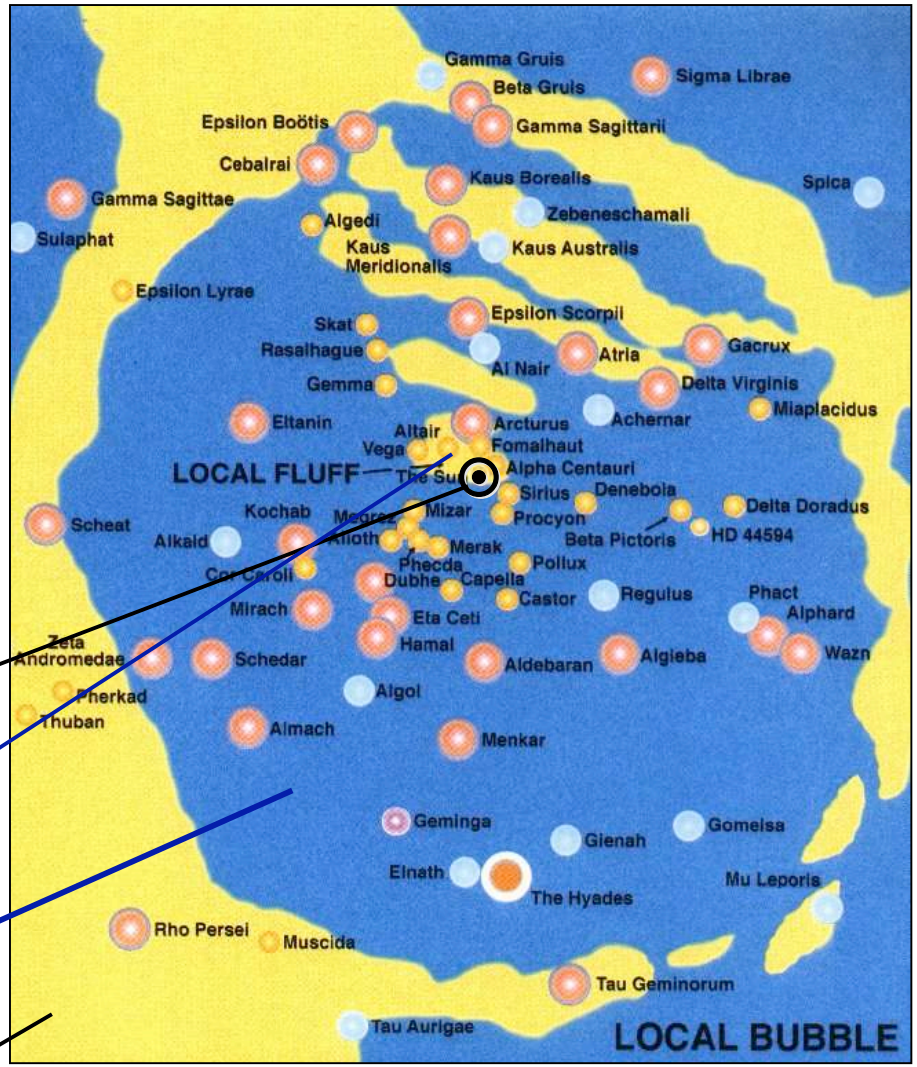
Is it real ?

or due to observational/analysis uncertainties (Pettini 08) **?**

What should be taken as the primordial D/H ?

around the sun





Sun

Local Interstellar Cloud
D ~ 5-15 pc

Local Bubble
D ~ 100 pc

Solar neighbourhood
D < 1 kpc