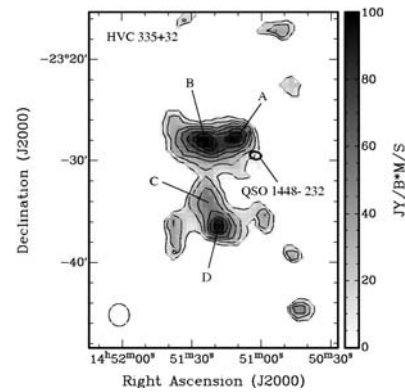


Small-scale structure in the Milky Way's circumgalactic gas

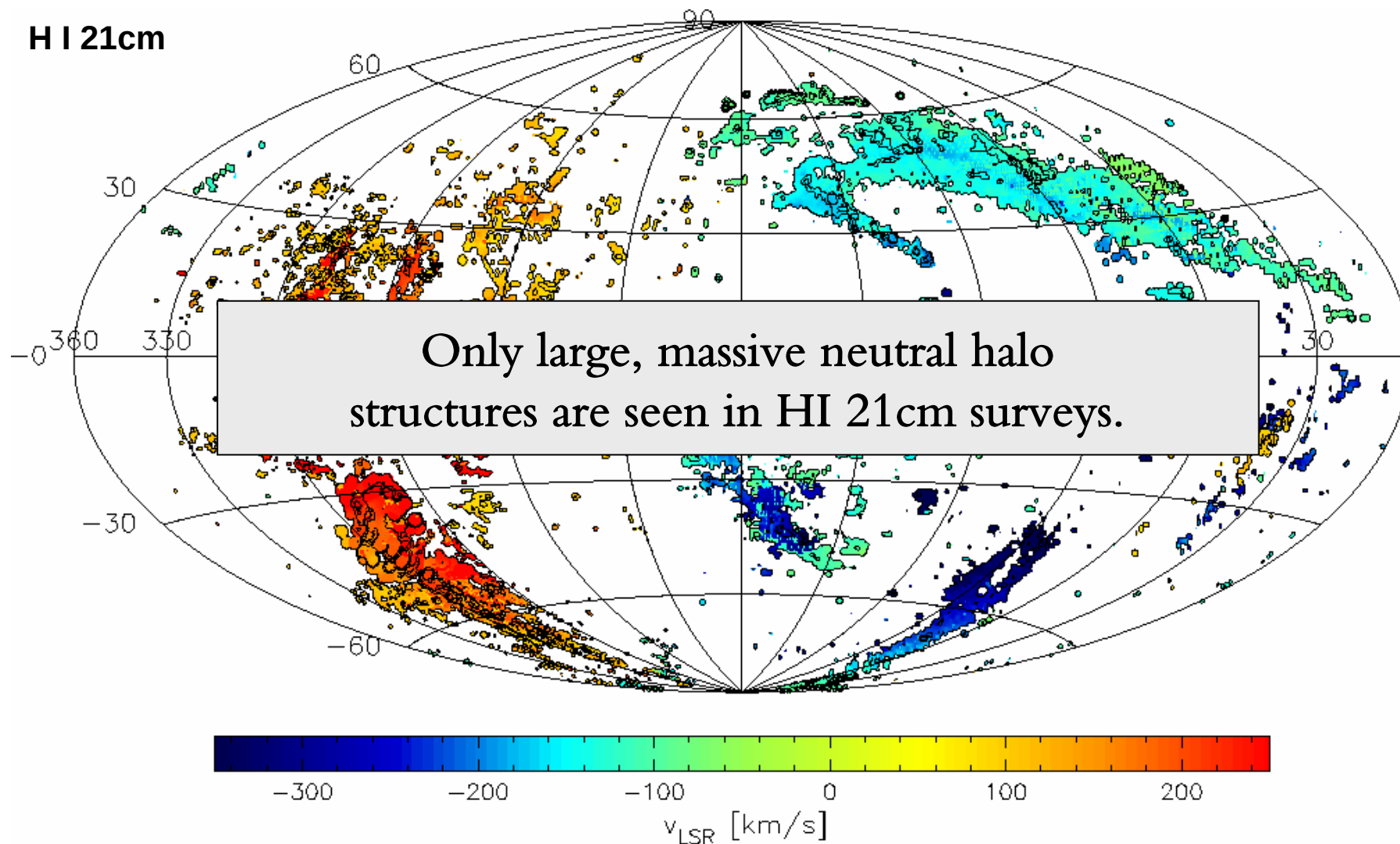


Philipp Richter



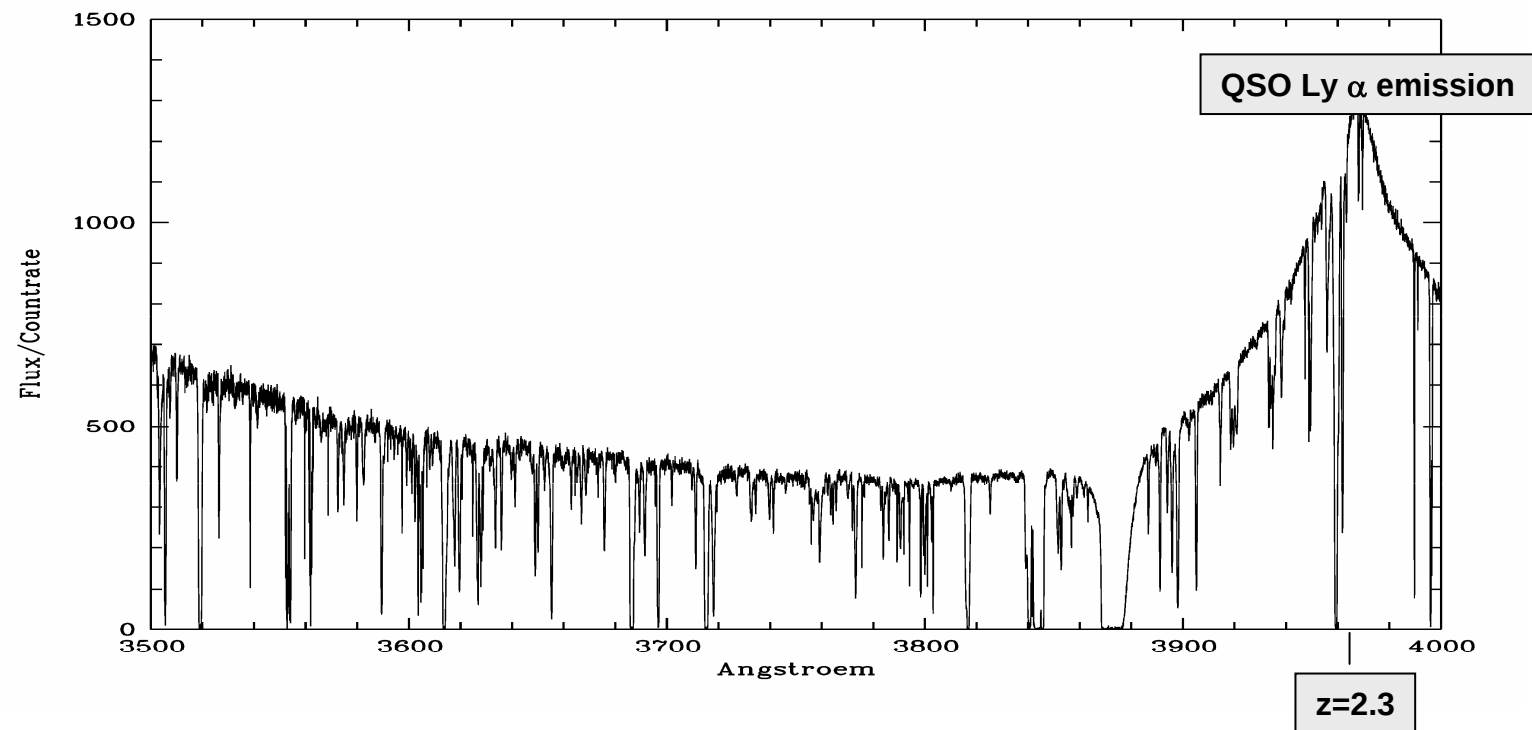
HI HIGH-VELOCITY CLOUDS

HI 21cm



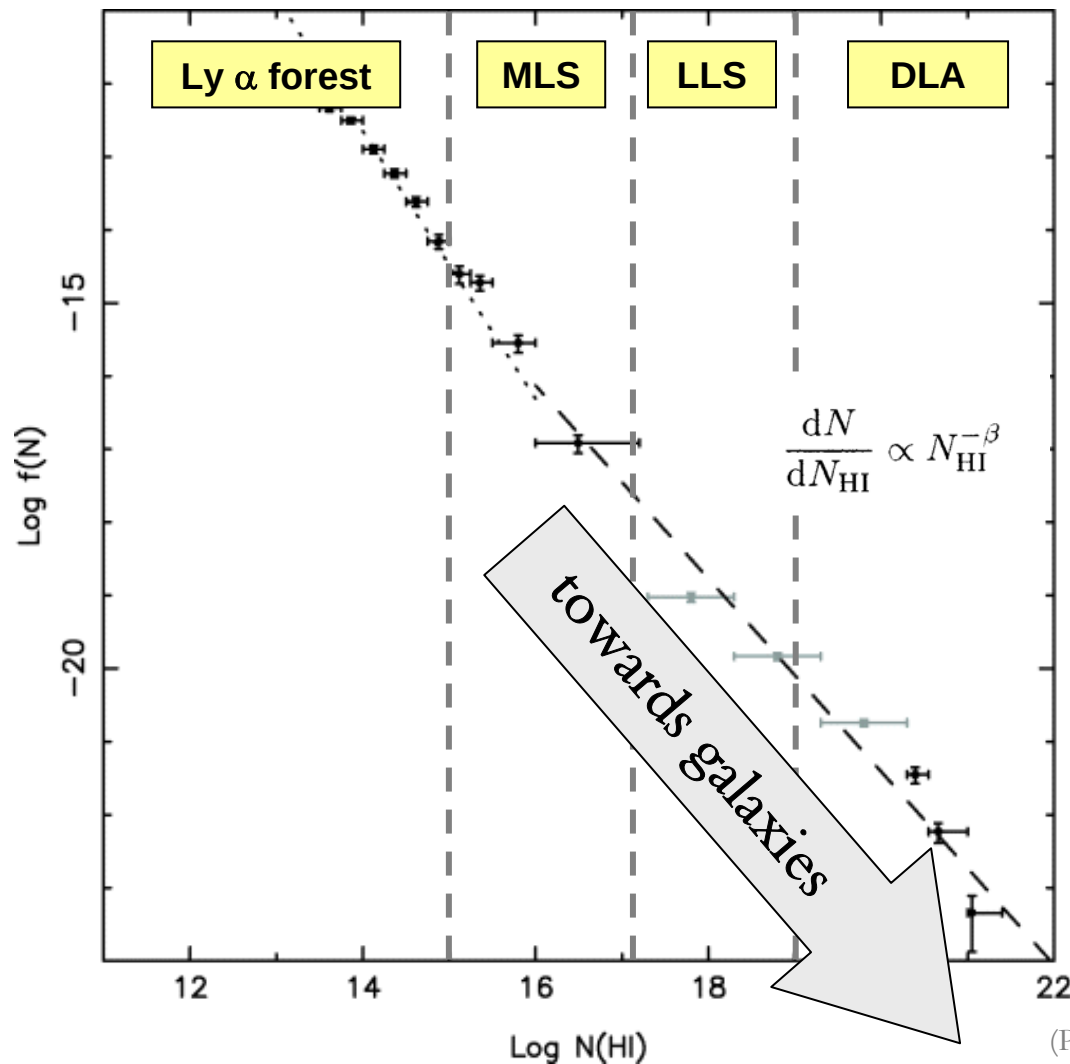
(Wakker 2001, ApJS 136, 463, W01)

QSO ABSORPTION LINE SYSTEMS

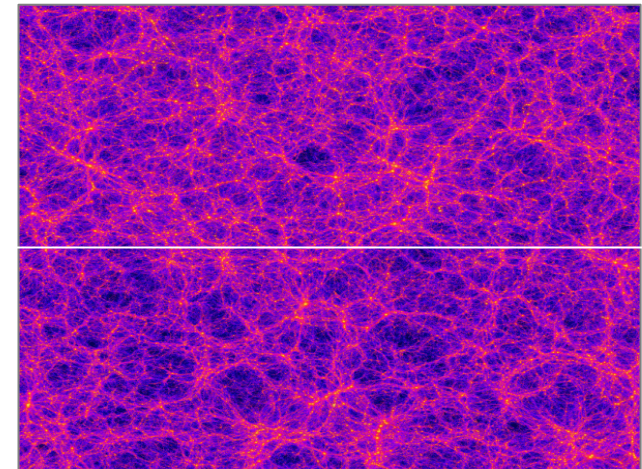


(Richter et al. 2005, A&A 440, 819)

QSO ABSORPTION LINE SYSTEMS



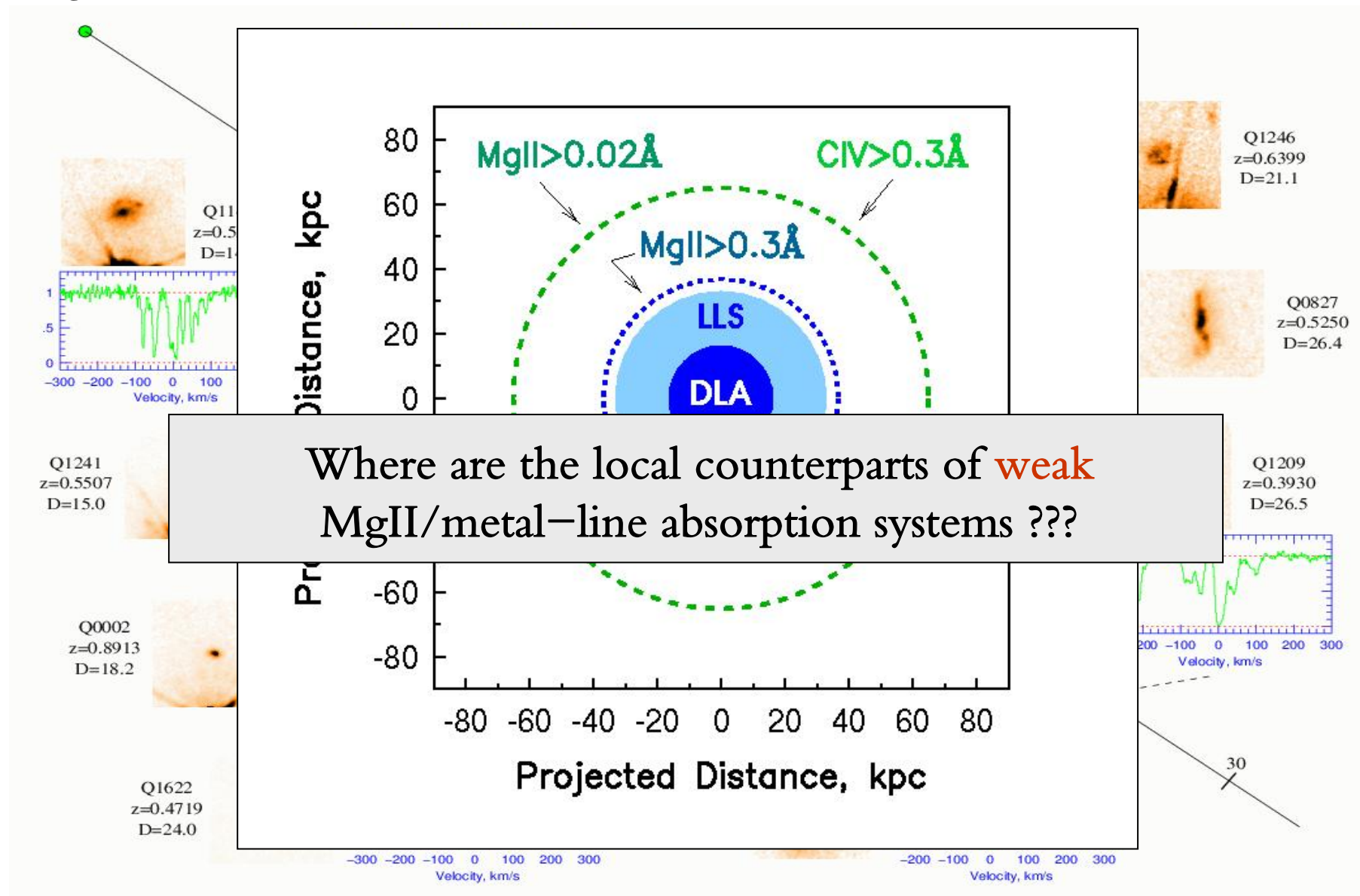
large-scale structure



... as well as galaxies and
their gaseous environment

(Petitjean et al. 1993, MNRAS 262, 499)

Mg II ABSORBERS AND GALAXY HALOS



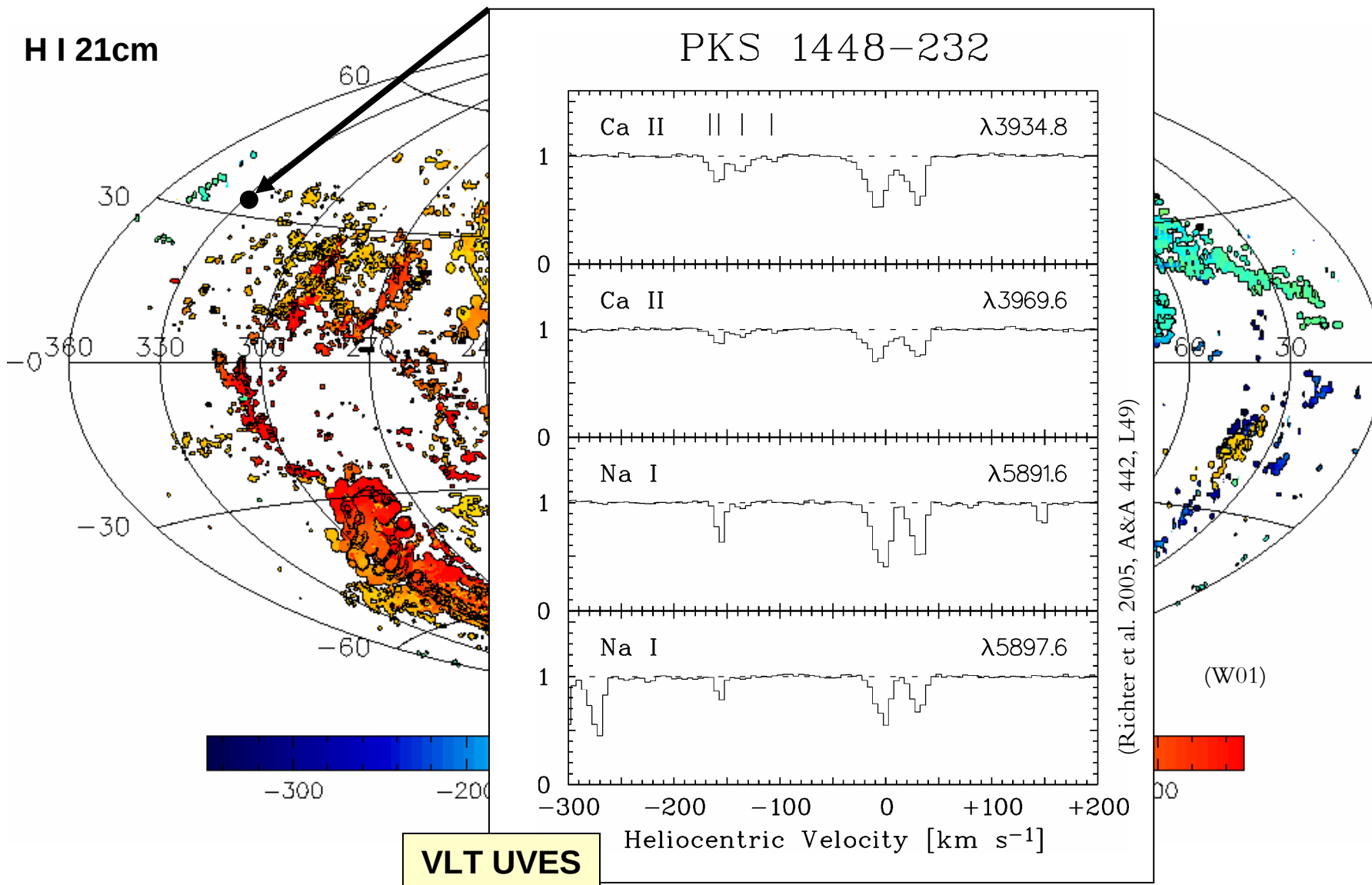
WEAK HALO ABSORBER SURVEY

- Large number (>200) of optical QSO spectra from VLT/UVES and KECK/HIRES to study weak high-velocity Ca II and Na I absorption
- Complete STIS/FUSE low-redshift QSO data to search for weak CII and OI absorption in the halo
- Follow-up HI 21cm observations (Effelsberg, Westerbork, VLA)

Collaborators:

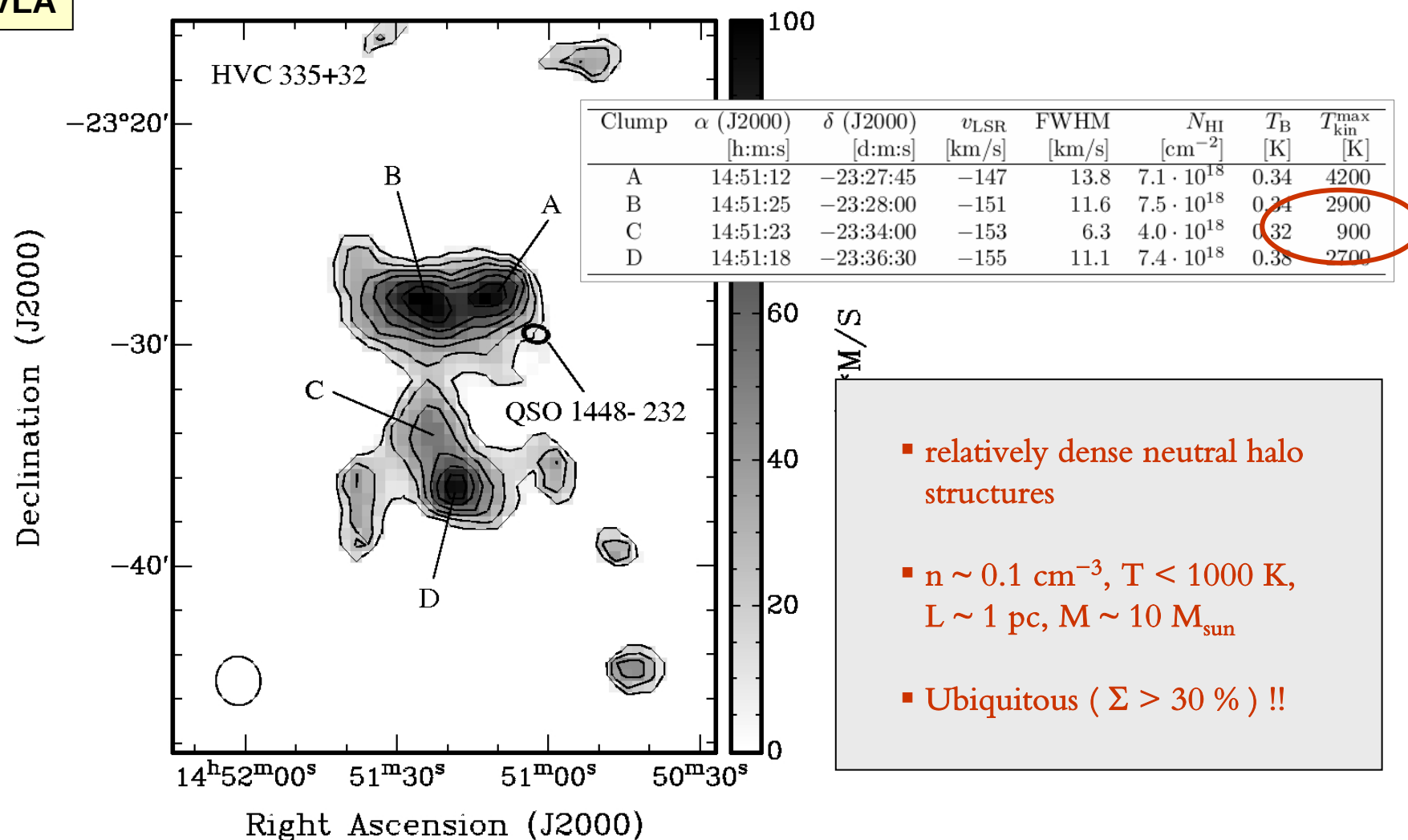
Tobias Westmeier, Nadya Ben Bekhti, Soroush Nasoudi Shoar, Alessio Fangano, Klaas de Boer, Juergen Kerp, Jane Charlton, Mike Murphy, Cedric Ledoux

HIGH-VELOCITY CaII ABSORBERS



HIGH-VELOCITY CaII ABSORBERS

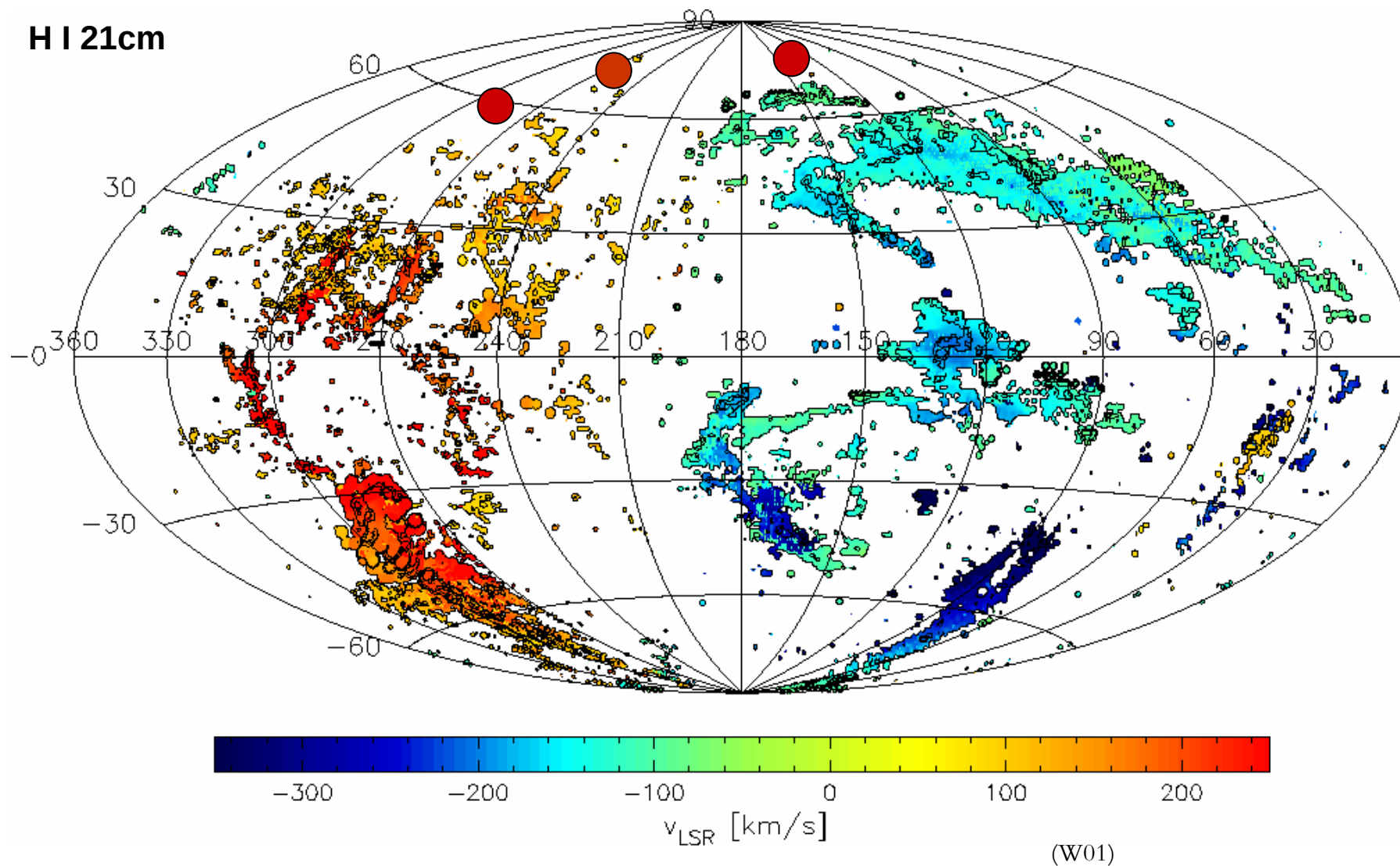
VLA



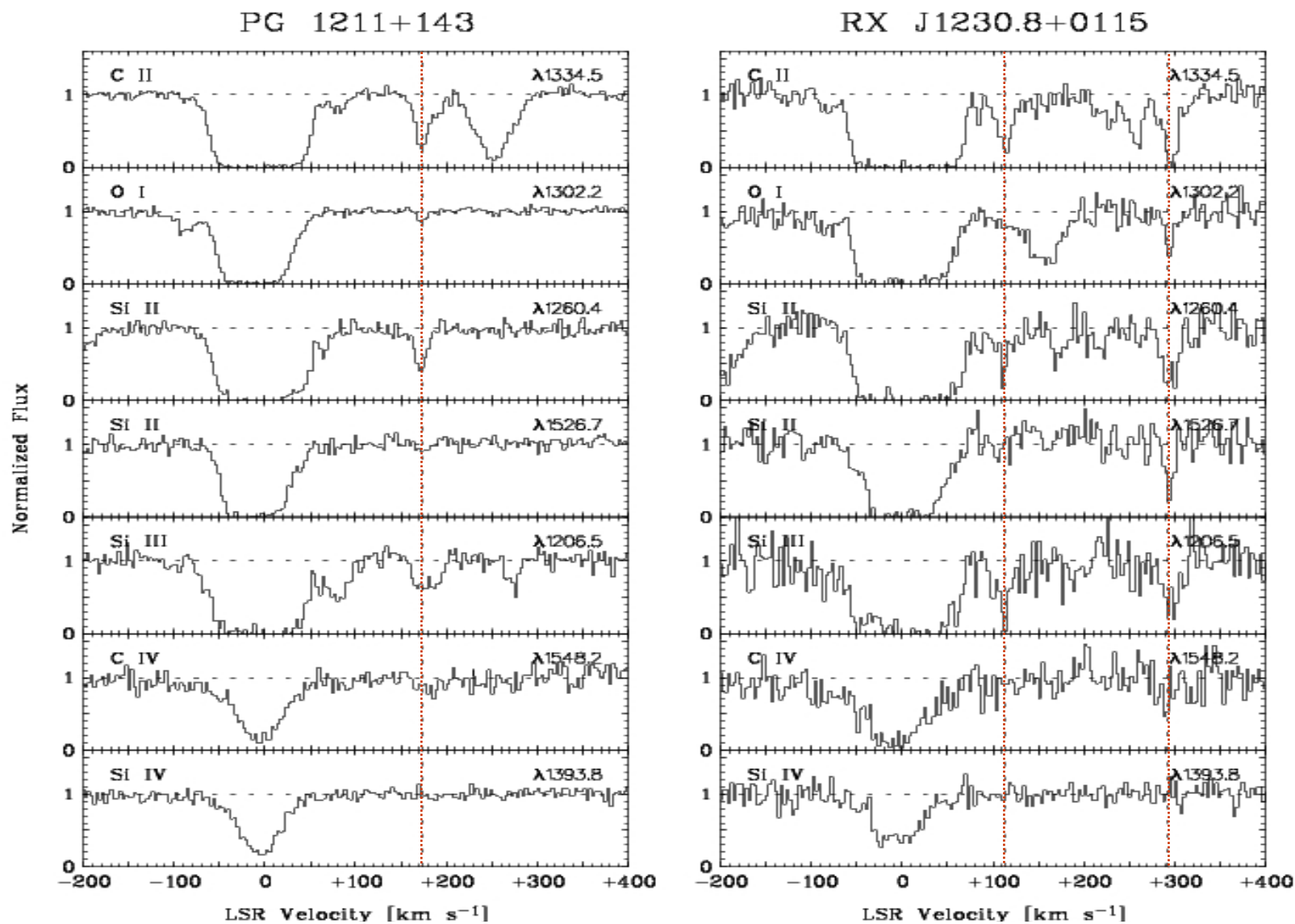
(Richter et al. 2005, A&A 442, L49)

WEAK HIGH-VELOCITY OI/CII ABSORBERS

H I 21cm

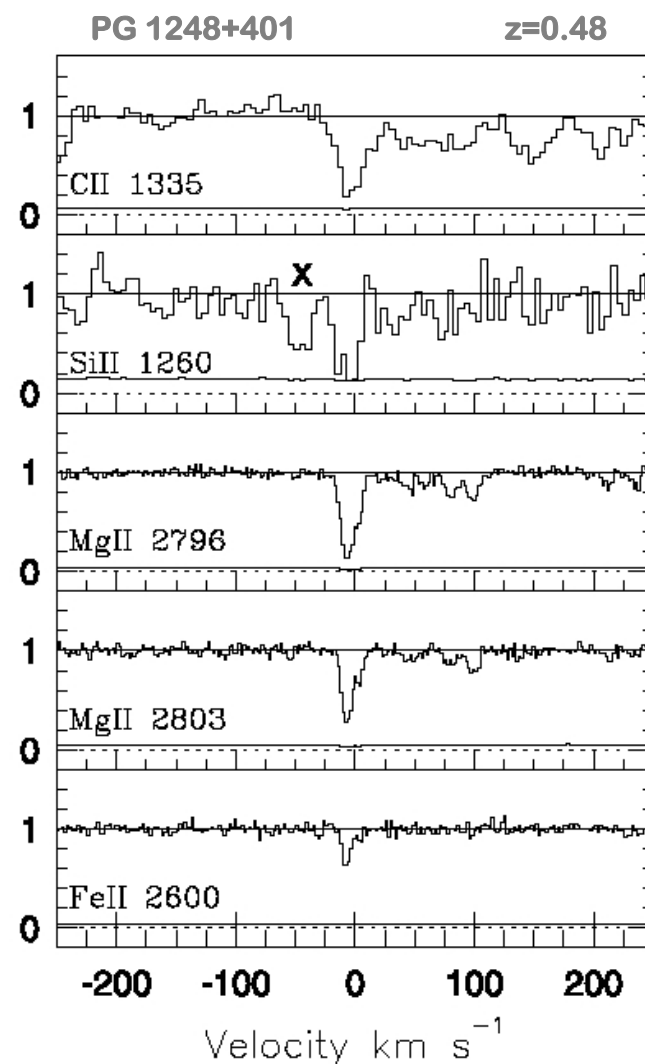
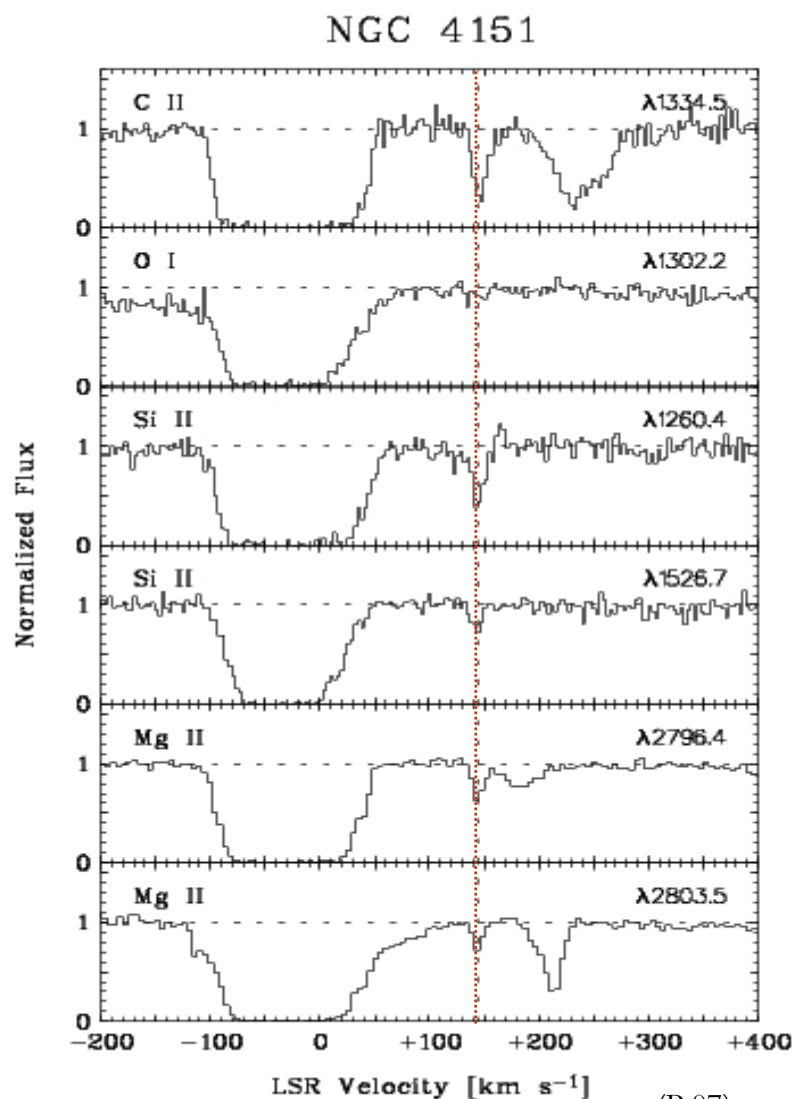


WEAK HIGH-VELOCITY OI/CII ABSORBERS



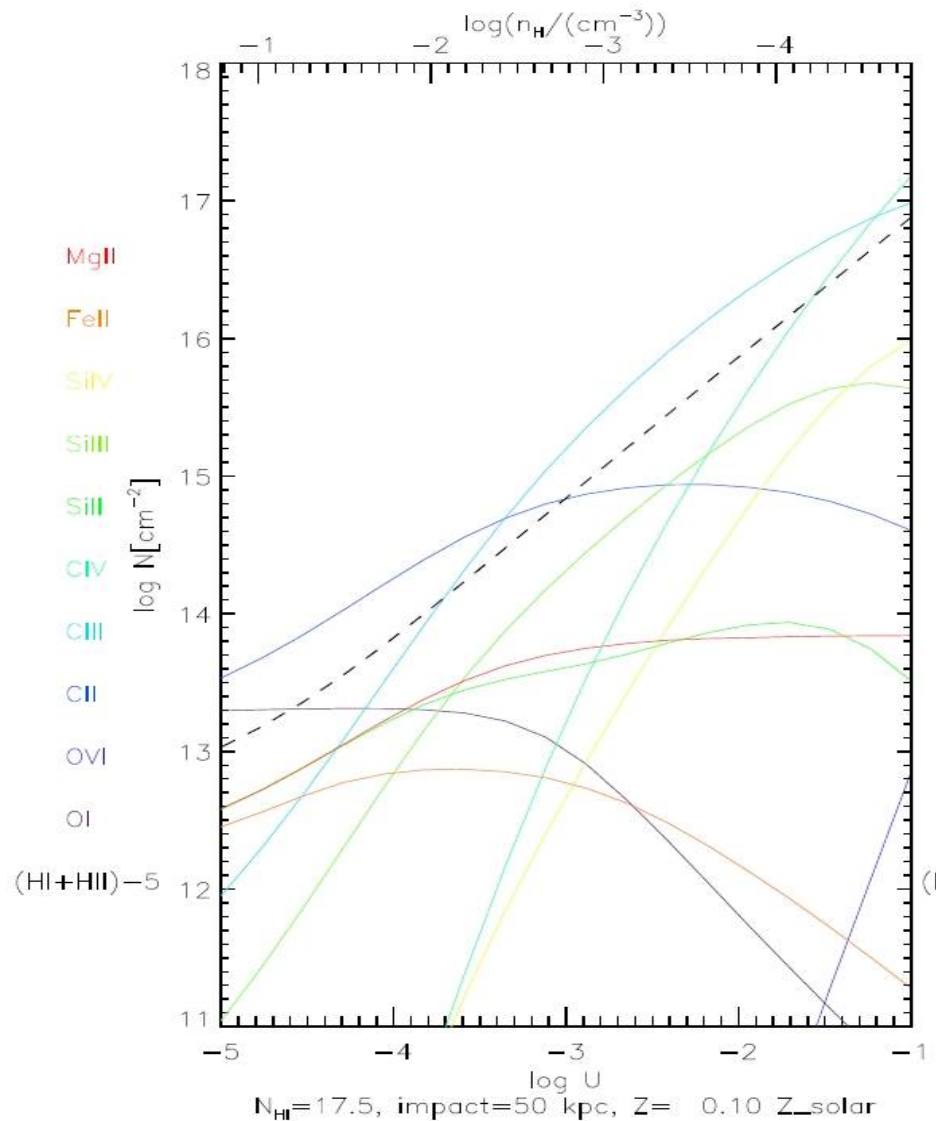
(Richter et al. 2007, in prep., R07)

WEAK HIGH-VELOCITY OI/CII ABSORBERS



(Milutinovic et al. 2006, ApJ 641, 190)

IONIZATION MODELING

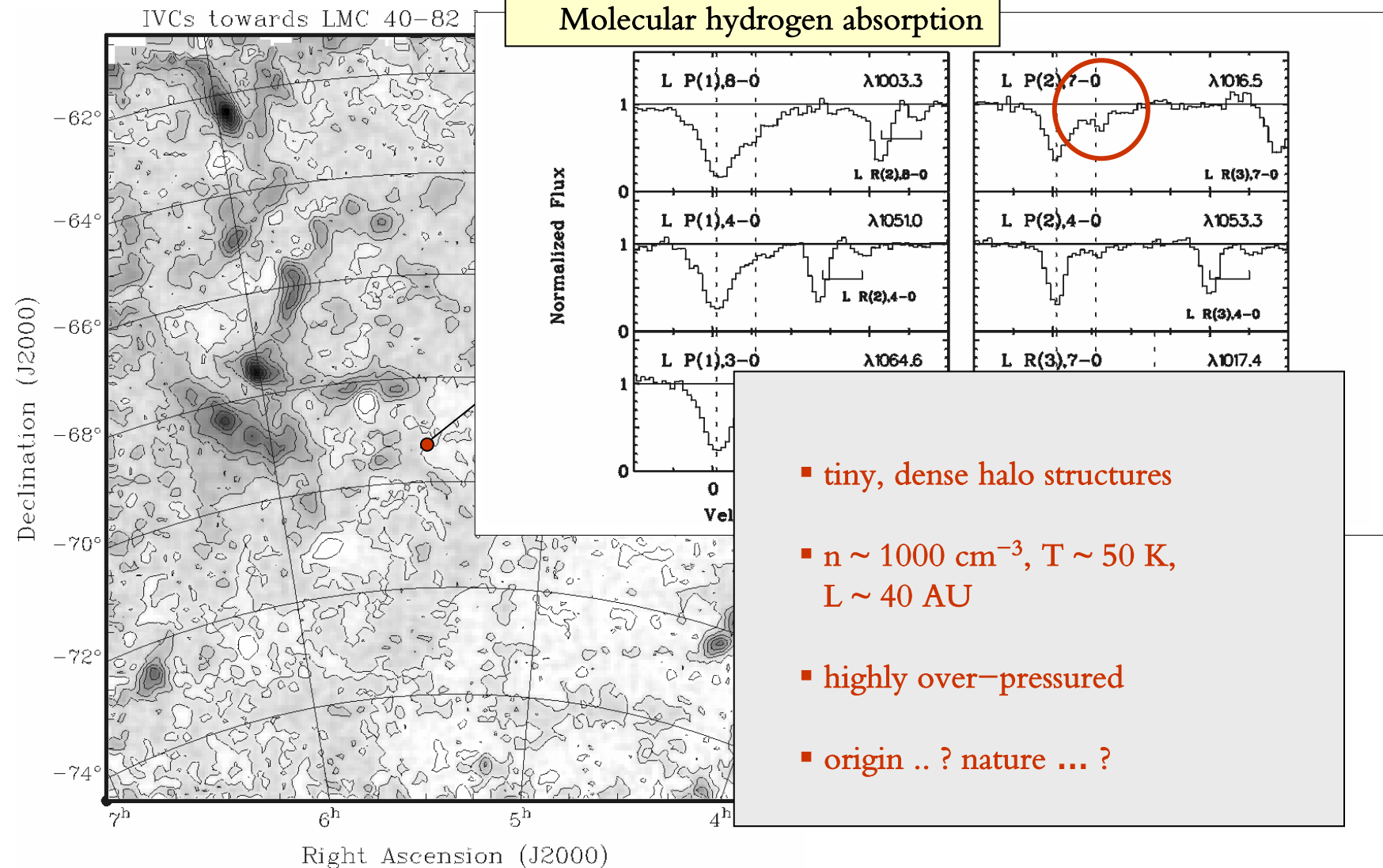


- low-column density gaseous halo structures
- very confined, partly ionized
- $n \sim 1 \text{ cm}^{-3}$, $N(\text{HI}) < 10^{17} \text{ cm}^{-2}$, $L < 1 \text{ pc}$
- over-pressured ?
- origin ... ? distance ... ?
- local „weak MgII systems“

(R07)

AU-SCALE STRUCTURES IN THE HALO

(Richter et al. 2003, A&A 405, 1013)



(L. Staveland-Smith, priv. Comm.)

SUMMARY

- The Milky Way is surrounded by a population of low-column density gas clumps with remarkable properties
- This gas probably lives in very small structures at sub-pc scale and is an extreme multi-phase medium
- The absorption signatures of these structures mimic those of metal-line systems surrounding other galaxies