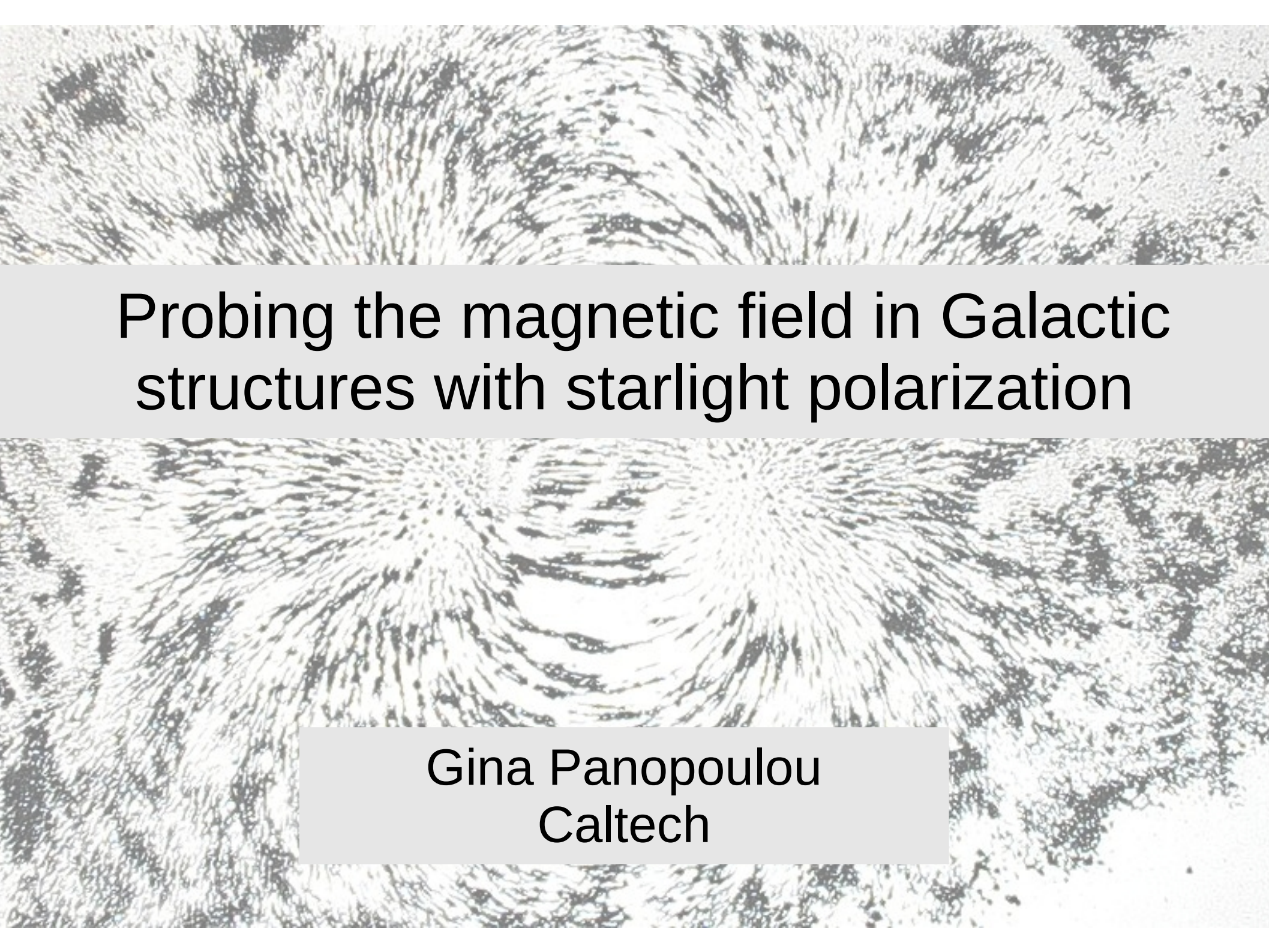
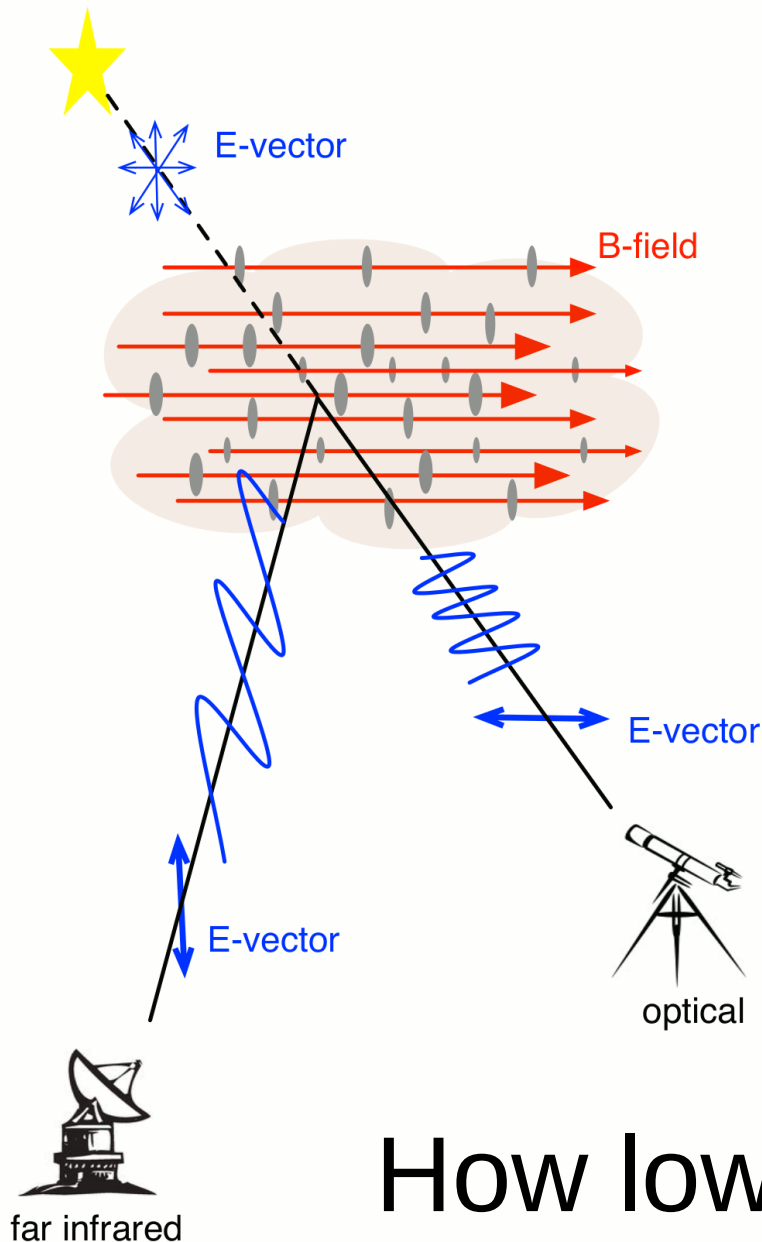




Probing the magnetic field in Galactic structures with starlight polarization

Gina Panopoulou
Caltech

Foreground control from 455 THz



A high-accuracy optopolarimetric survey of the high-latitude sky

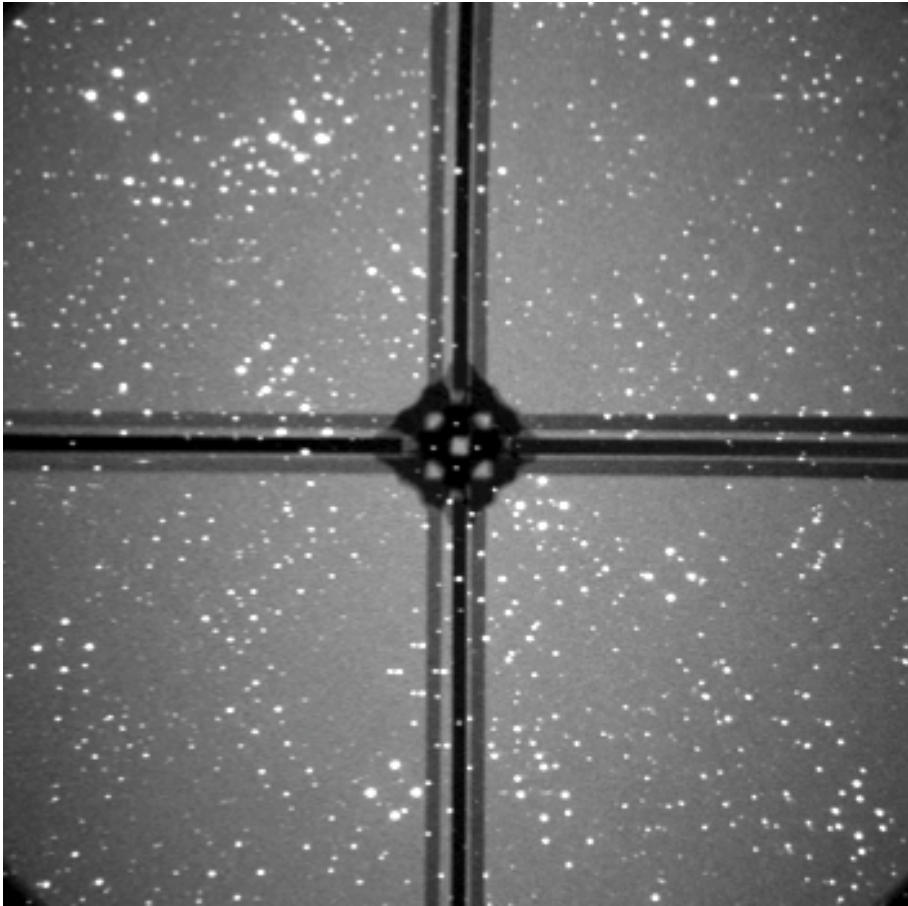


PASIPHAE

pasiphae.science

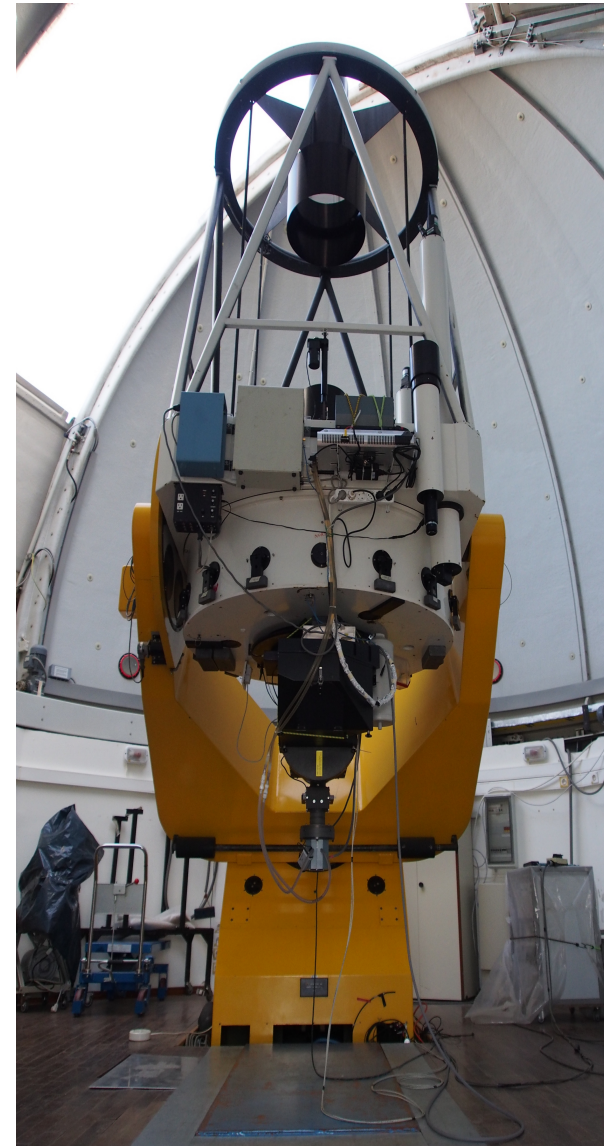
How low can we go in p ?

Optical polarimetry with RoboPol



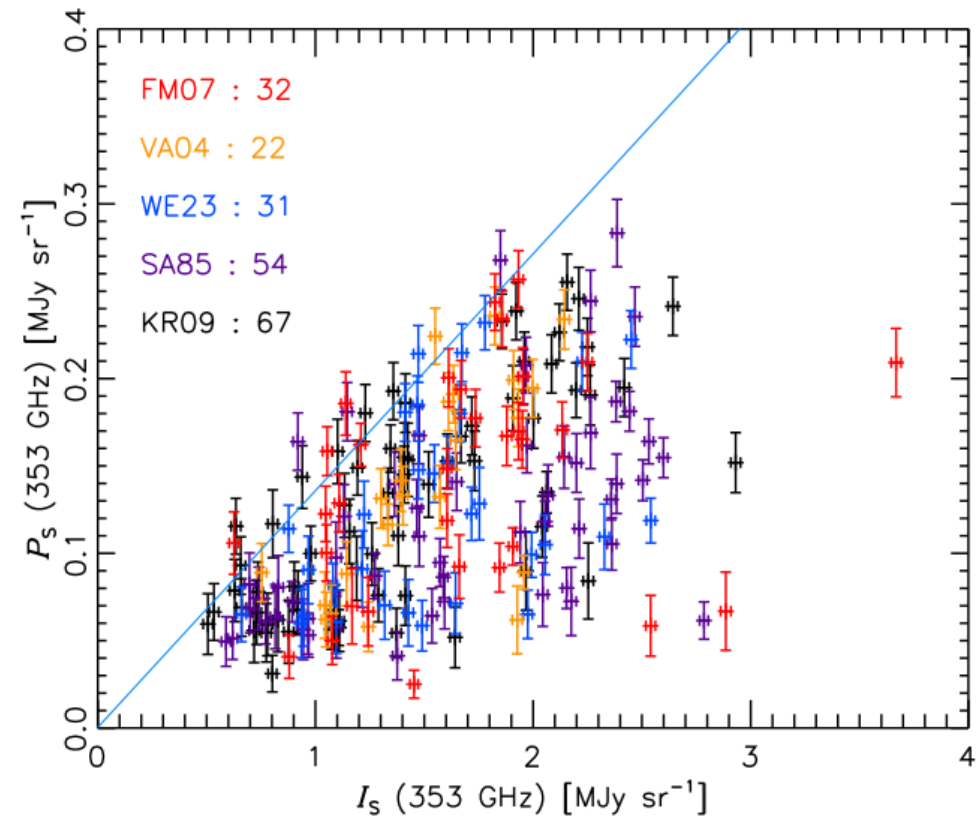
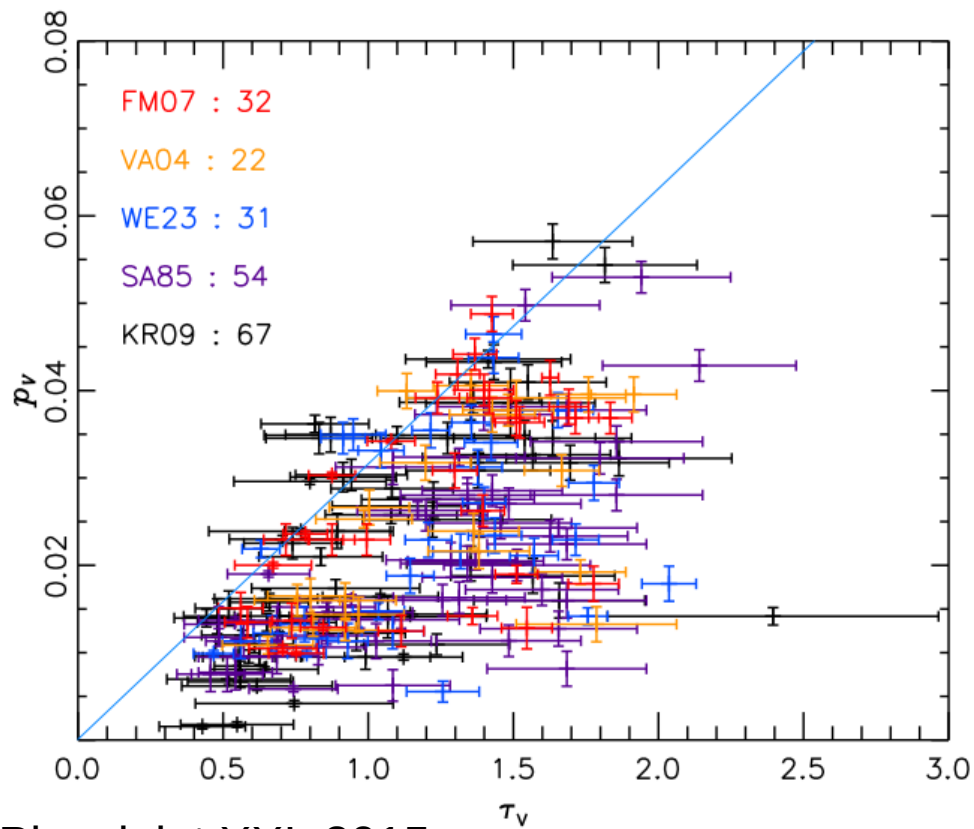
13 arc-minutes

robopol.org



Skinakas
1.3 m

Lowest p where least dust

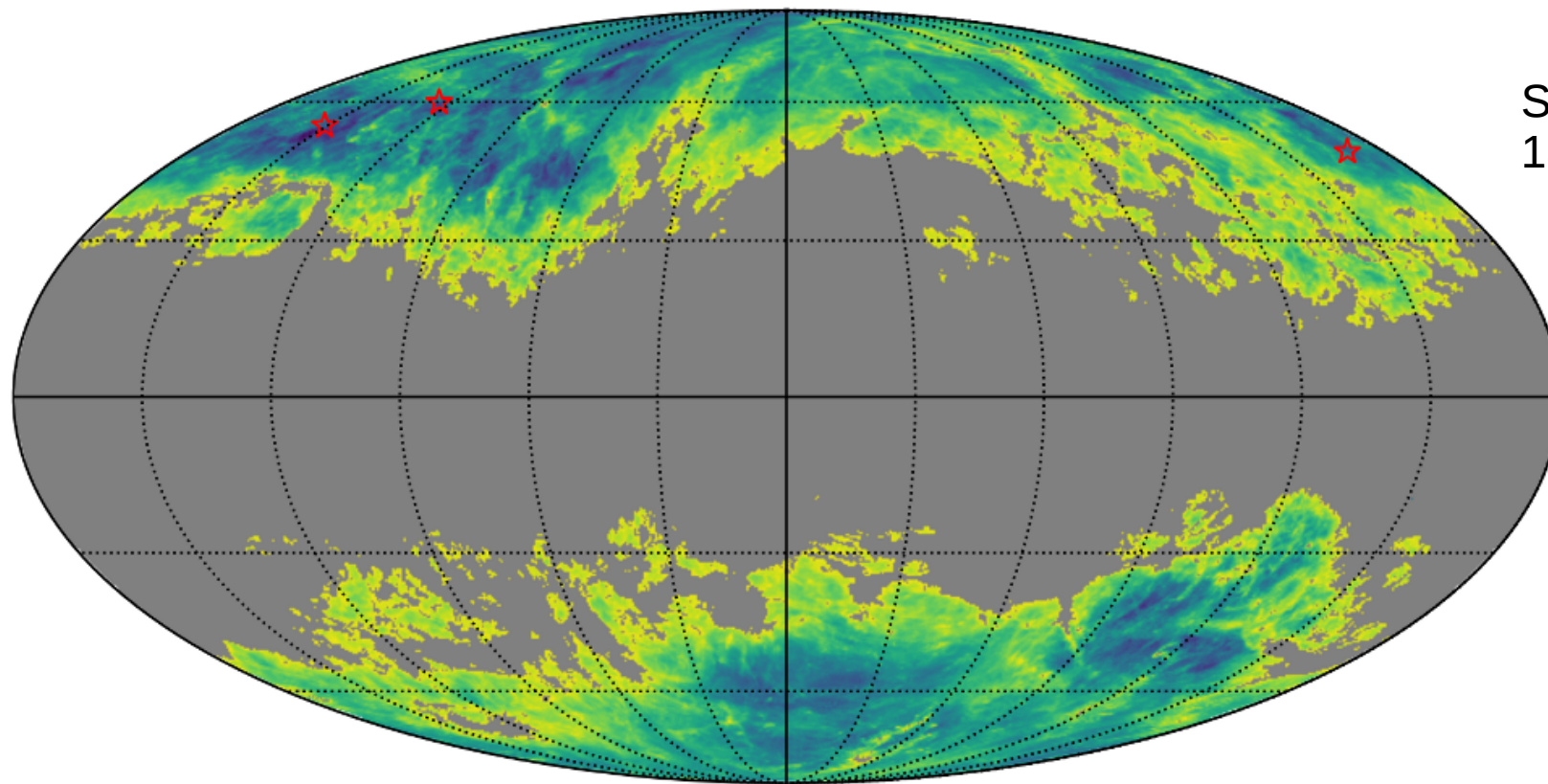


Planck int XXI, 2015

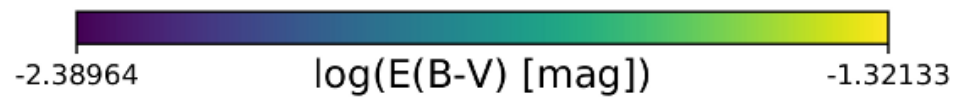
$$p_{max} \approx 9 E(B - V)(\%/mag)$$

Hiltner (1956), Serkowski+ (1975)

The Dark Patches

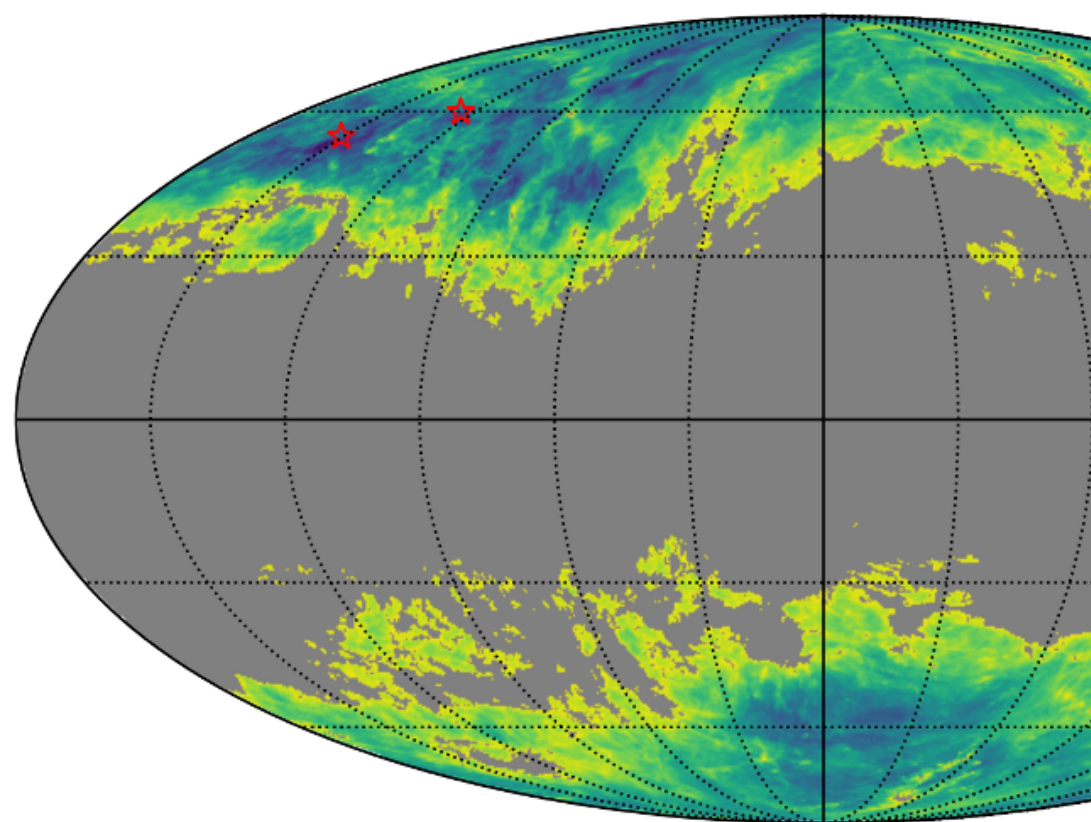


Skalidis et al.
1802.04305



Lenz+ 2017 E(B-V) map

The Dark Patches

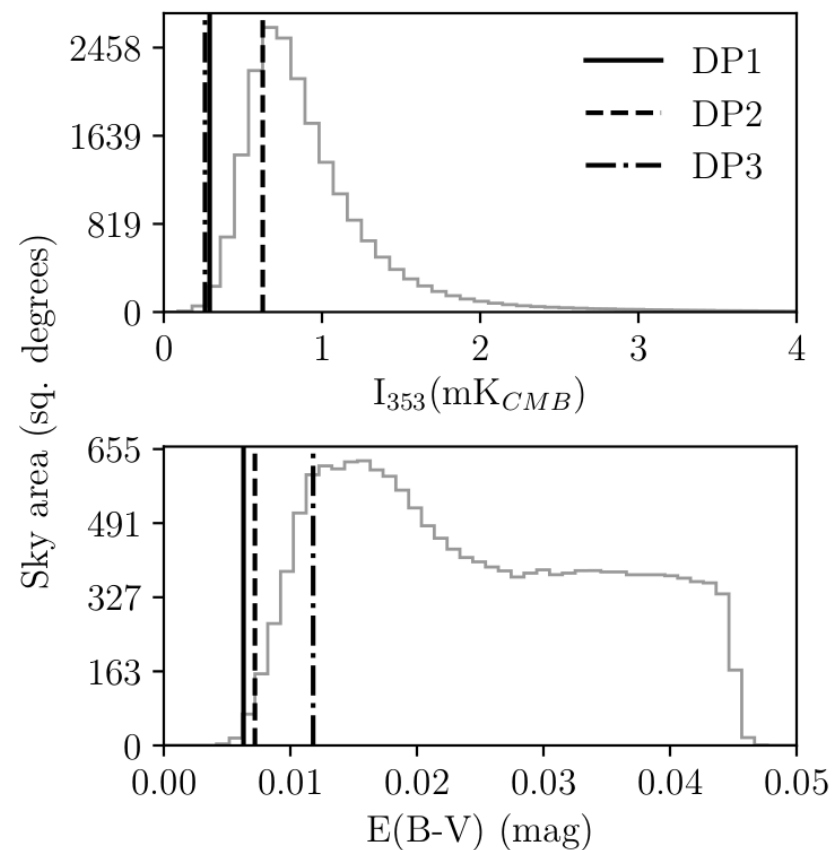


-2.38964

$\log(E(B-V) \text{ [mag]})$

Lenz+ 2017 E(B-V) map

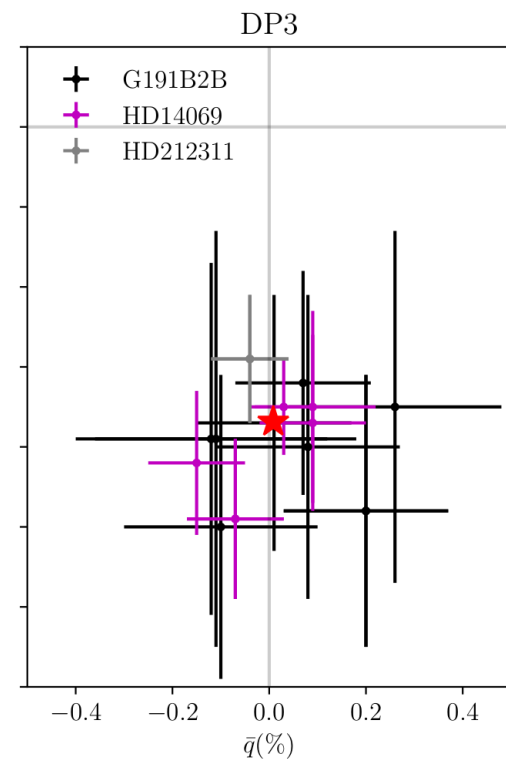
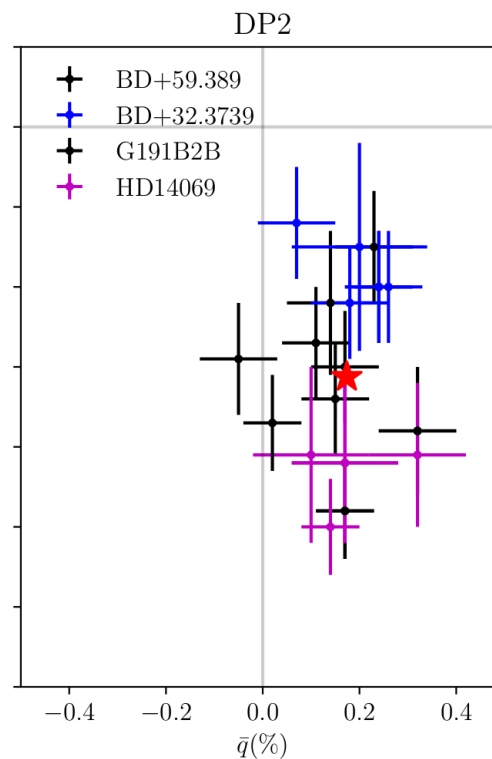
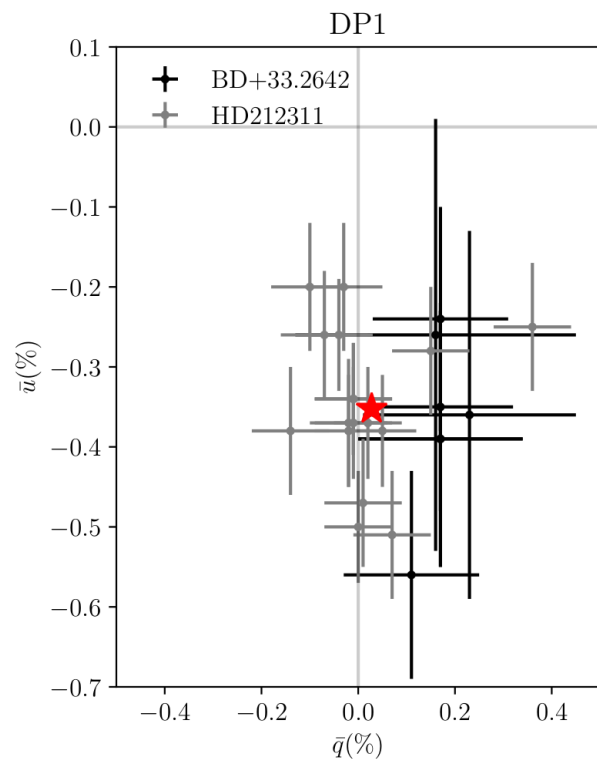
Skalidis et al.
1802.04305



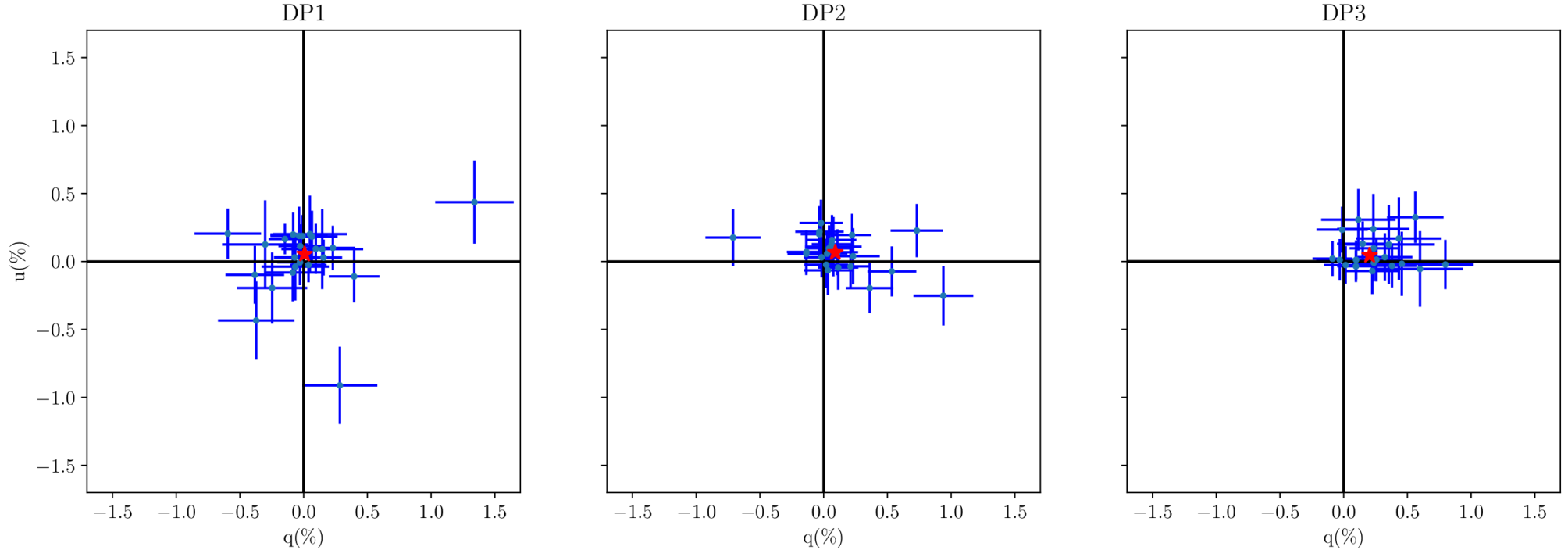
Keeping systematics at 0.1%

Contributing Factors

- Variable instrument behavior
- Variable sky conditions
- Unaccounted uncertainties in calibrator stars reference values
- Intrinsic variability of calibrator stars

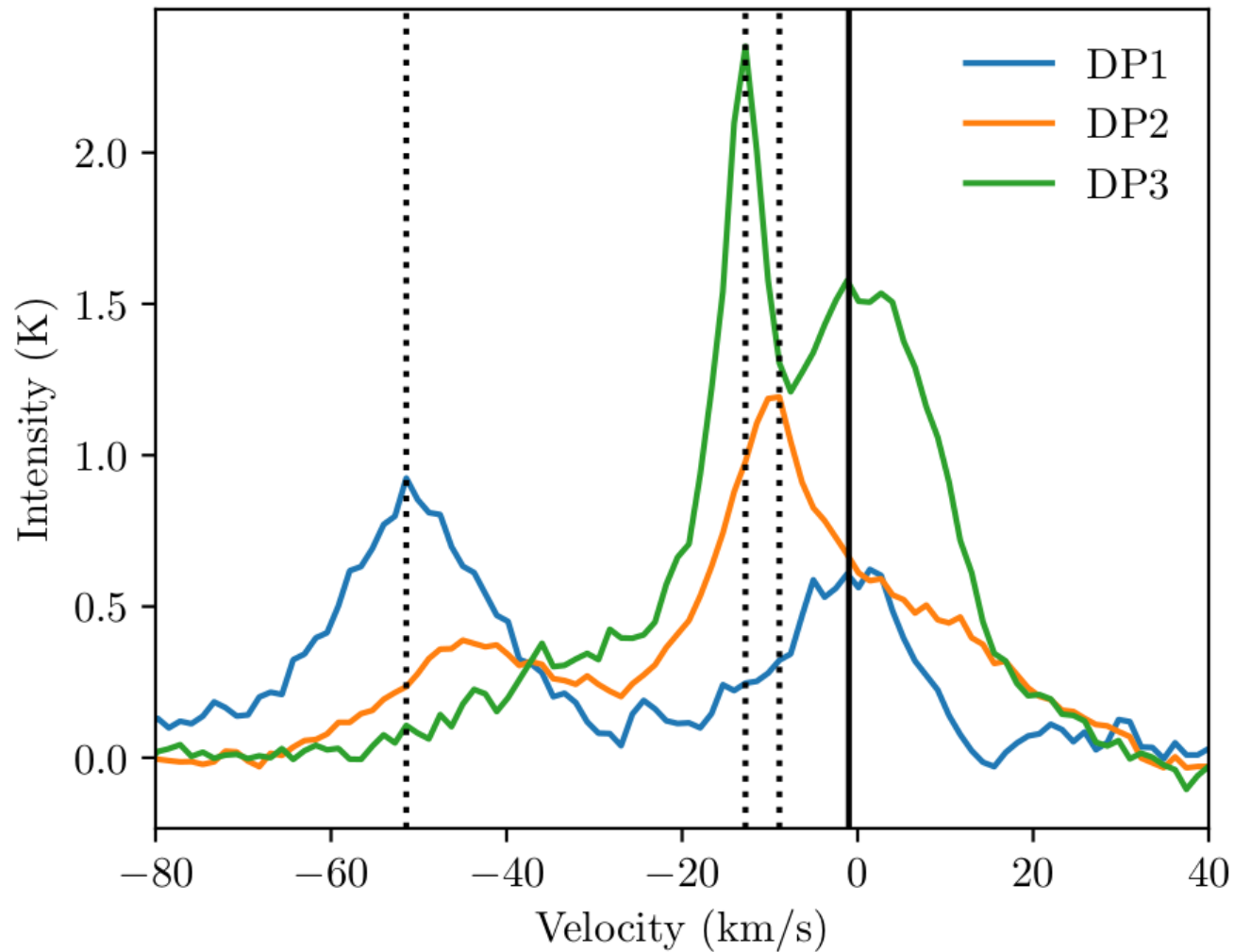


The mean polarization in the DPs



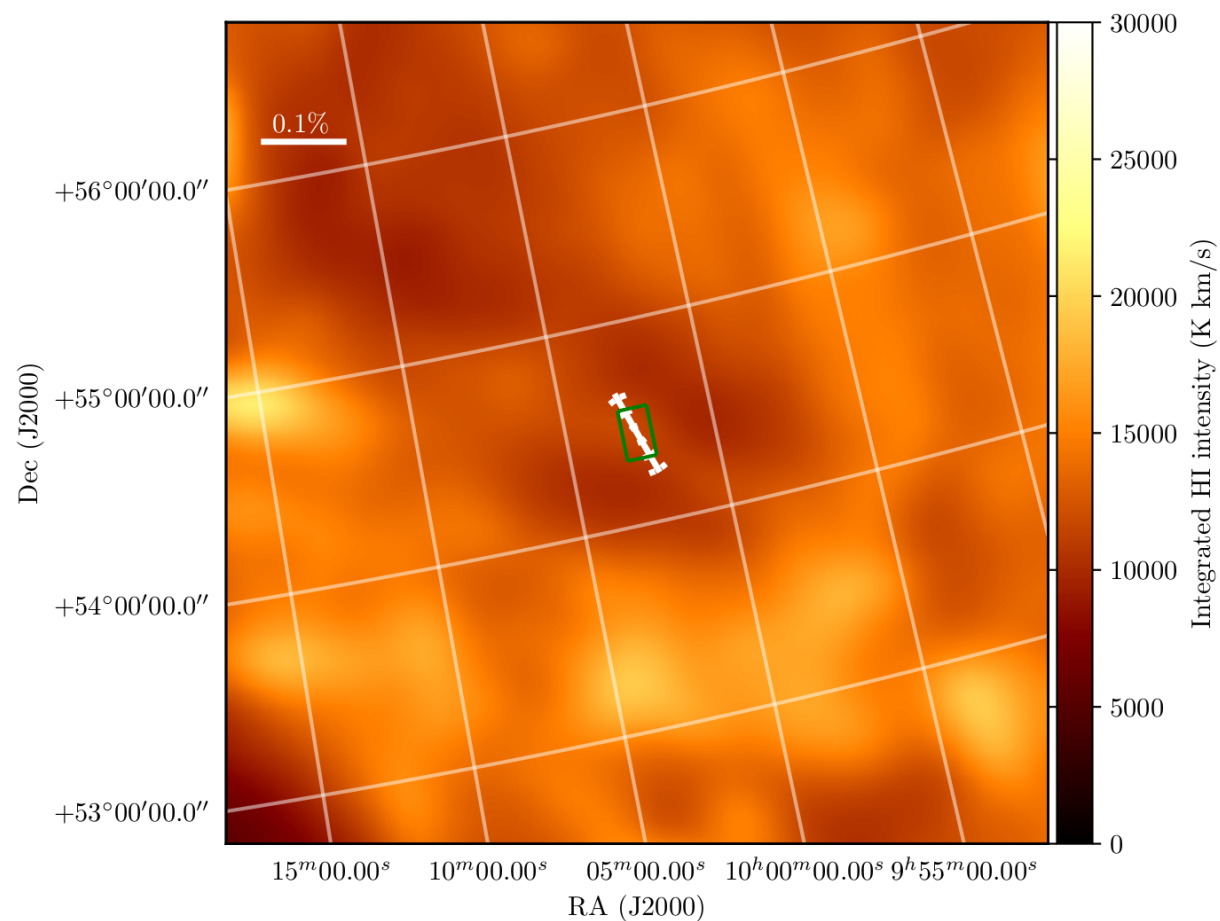
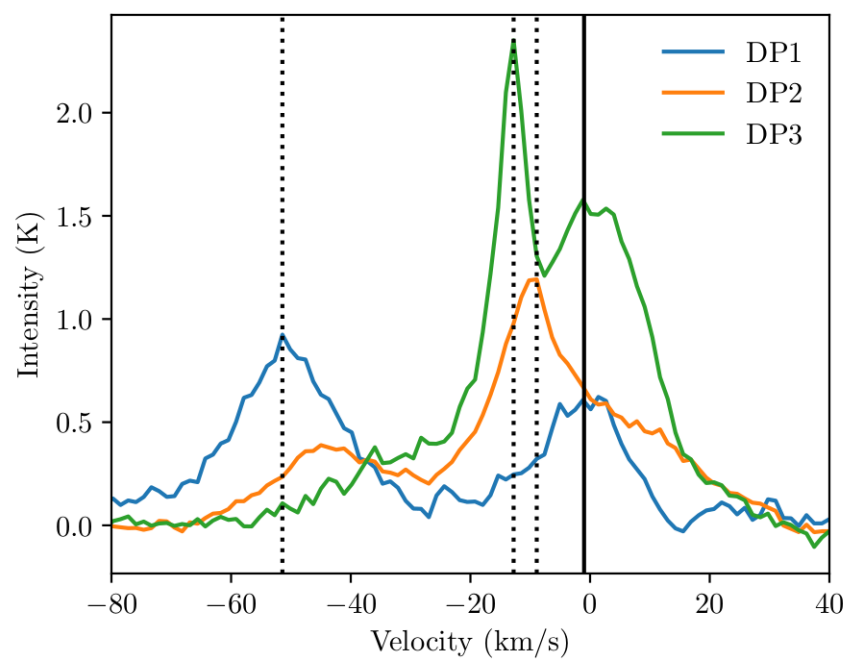
	$q_{mean} (\%)$	$u_{mean} (\%)$	$p_{mean} (\%)$	$\hat{p}_{mean} (\%)$	$\chi_{mean} (^\circ)$
DP1	0.007 ± 0.041	0.053 ± 0.037	0.054 ± 0.038	0.0	41 ± 22
DP2	0.091 ± 0.036	0.066 ± 0.036	0.113 ± 0.036	0.107	18 ± 9
DP3	0.203 ± 0.045	0.045 ± 0.037	0.208 ± 0.044	0.203	6 ± 5

The polarizing medium

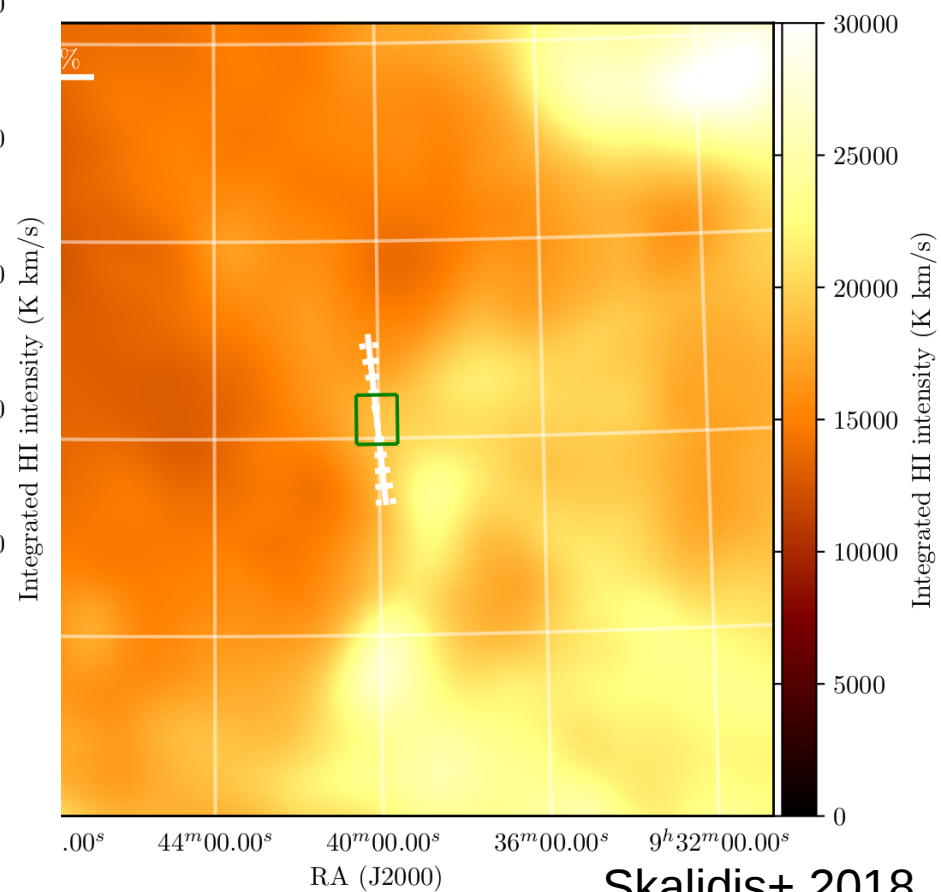
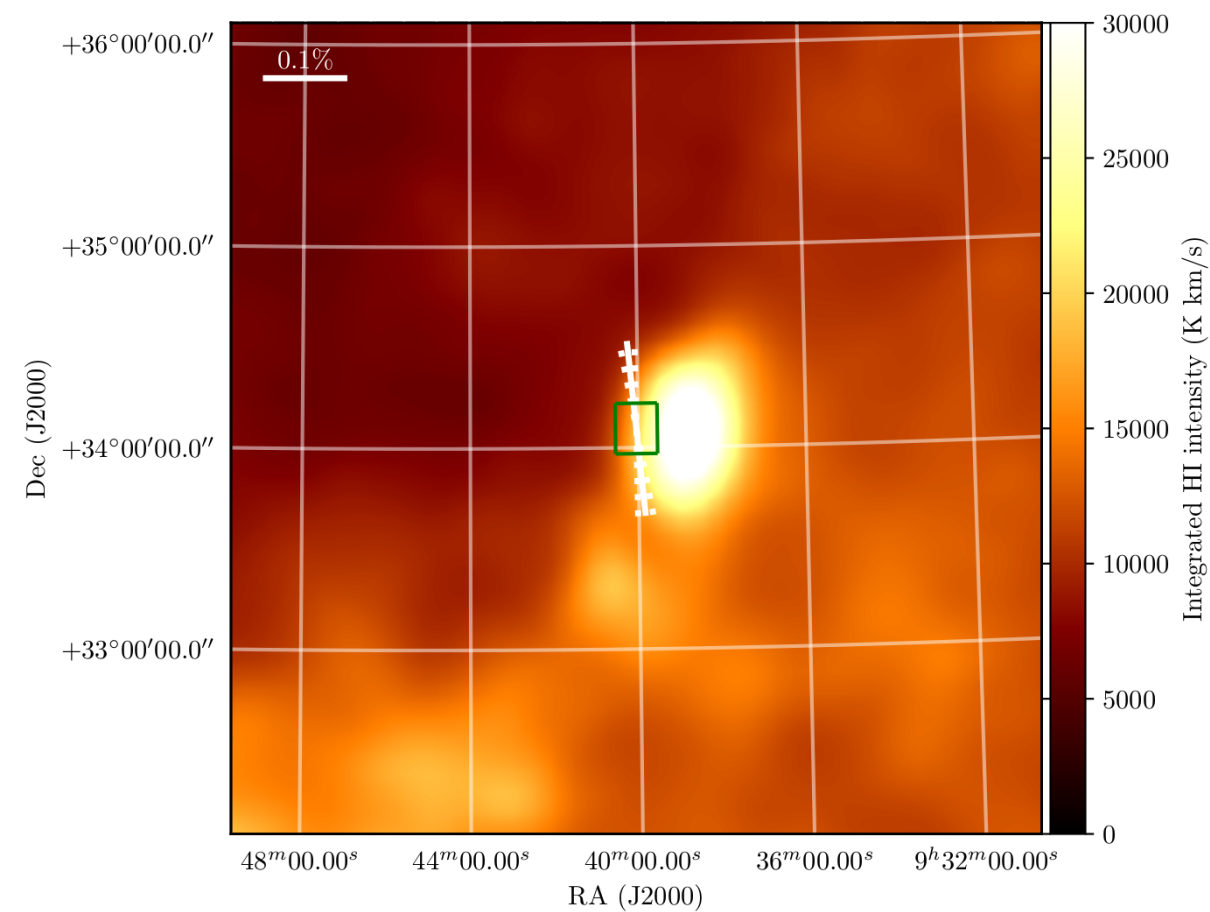
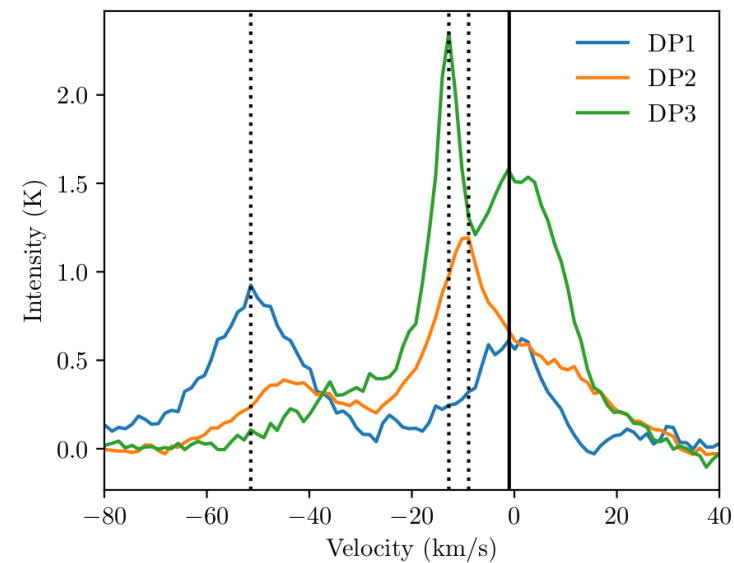


HI spectra from EBHIS survey

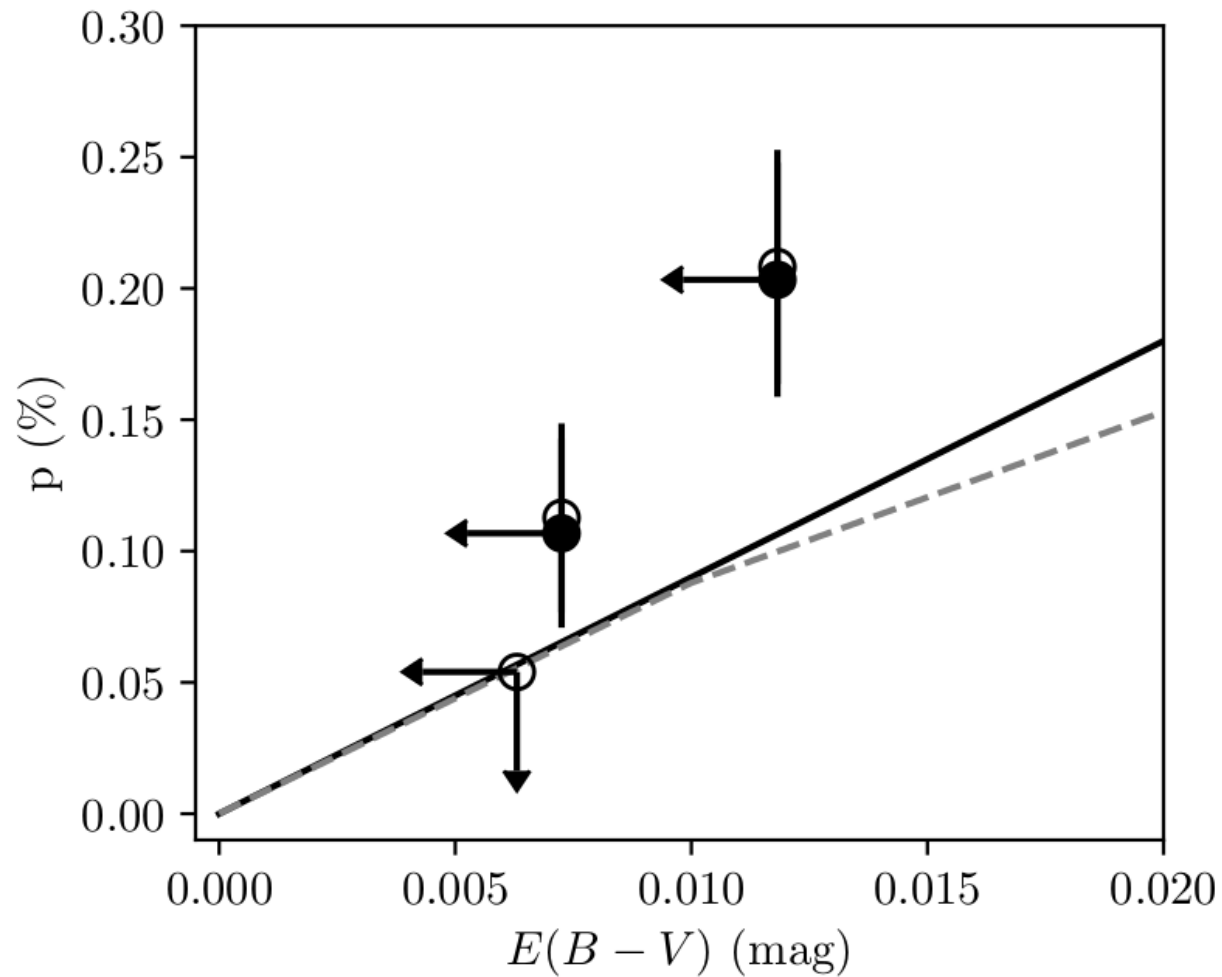
HI morphology in DP2



HI morphology in DP3



A higher polarizing efficiency?



Conclusions

- Control of systematics!
- $p_{\text{mean}} \sim 0.1\text{-}0.2\%$ (upper limit for DP1)
- θ_{mean} vs HI morphology
- p_{max} higher than general ISM at $E(B-V) < 0.01$ mag

Thank you!