SHAM implementations

EPFL - LABORATOIRE D'ASTROPHYSIQUE

My SHAM model has 3 parameters:

1. σ, controls the Vpeak-M* scatter, BOSS SHAM σ=0.31
2. Vceil, prevent the most massive halos from having a galaxy
3. Vsmear, smear the peculiar velocity for the z uncertainty

SHAM implementations

EPFL - LABORATOIRE D'ASTROPHYSIQUE

My SHAM model has 3 parameters:

1. σ, controls the Vpeak-M* scatter (**Vpeak scattering**)
2. Vceil, prevent the most massive halos from having a galaxy (**Vpeak_scat truncation**)
3. Vsmear, smear the peculiar velocity for the z uncertainty

SHAM implementations

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Vpeak scattering:

1. Gaussian scatter:

$$Vpeak\_scat = Vpeak*(1+N(0,\sigma_2))$$

Vpeak_scat truncation:

a. dsigma cut:

remove Vpeak_scat/σ >Vceil

SHAM for eBOSS LRG&ELG

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Optimal Parameter Properties:

1. **large optimal σ, increasing** as I extend the prior
2. **"L" shaped Vceil-σ posteriors,** meaning that for large σ, Vceil won't change (i.e., a random halo-galaxy relation)
3. They might be **out of the 1σ confidence interval**

SHAM posteriors for LRG in SGC

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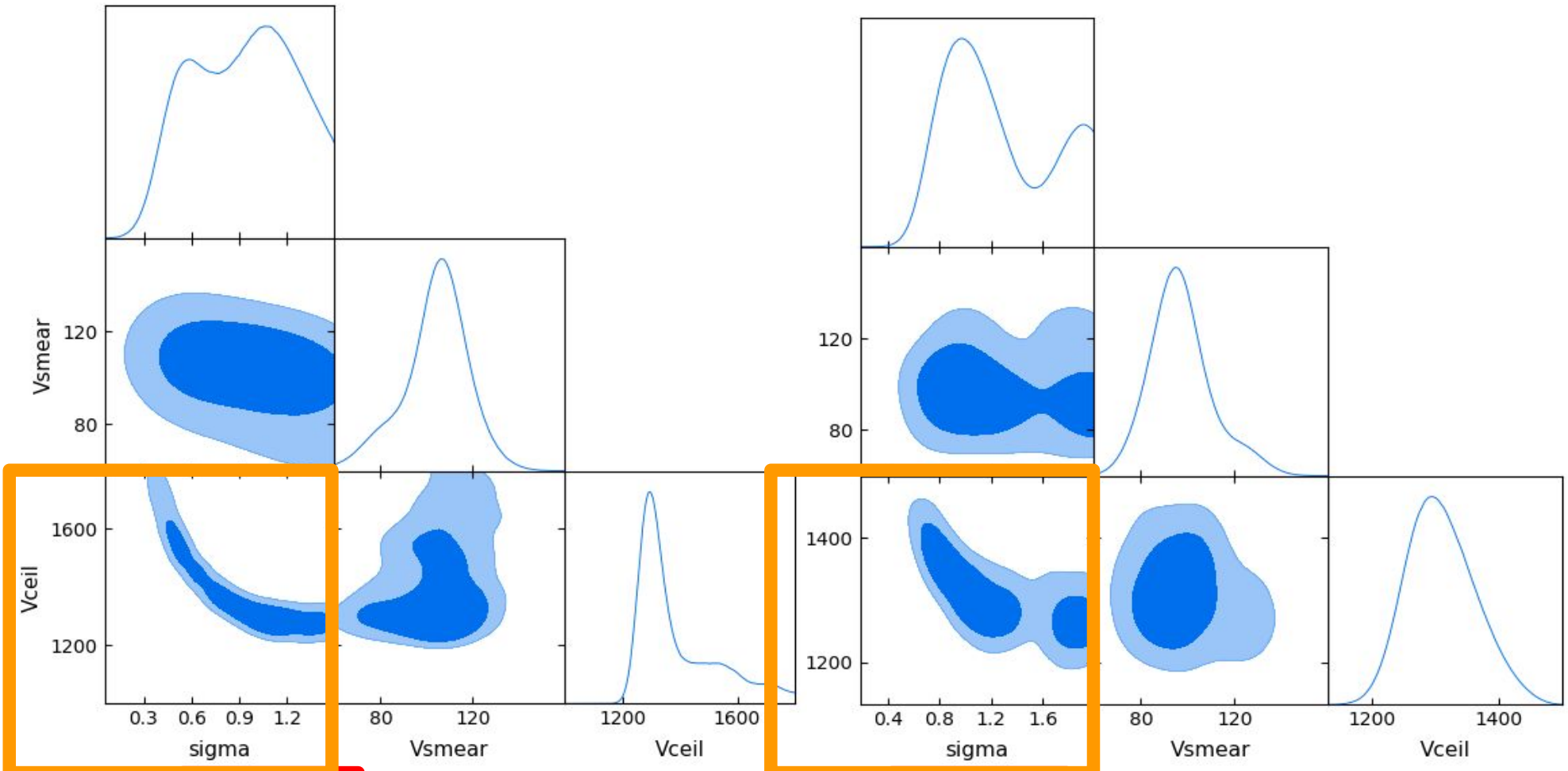
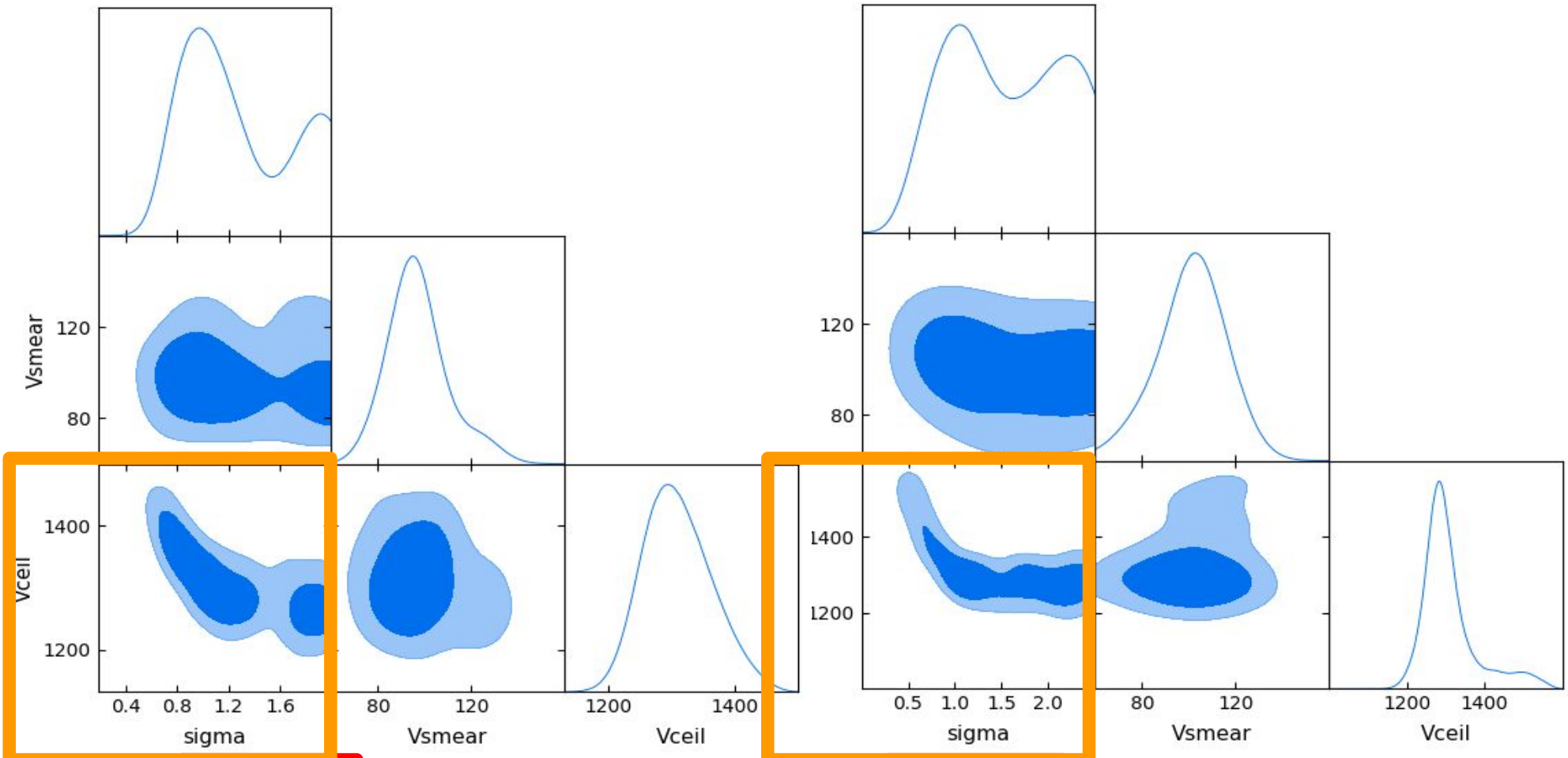


priors:	[0, 1.5]	[60, 160]	[1000, 1800]	[0, 2.0]	[60, 160]	[300, 1500]
optimal:	0.39	118	1724	0.89	108	1326
1σ interval:	[0.52, 1.25]	[90, 116]	[1270, 1546]	[0.80, 1.75]	[85, 109]	[1259,1368]
min chi2:		31.96	**???**		31.94	

SHAM posteriors for LRG in SGC

EPFL - LABORATOIRE D'ASTROPHYSIQUE



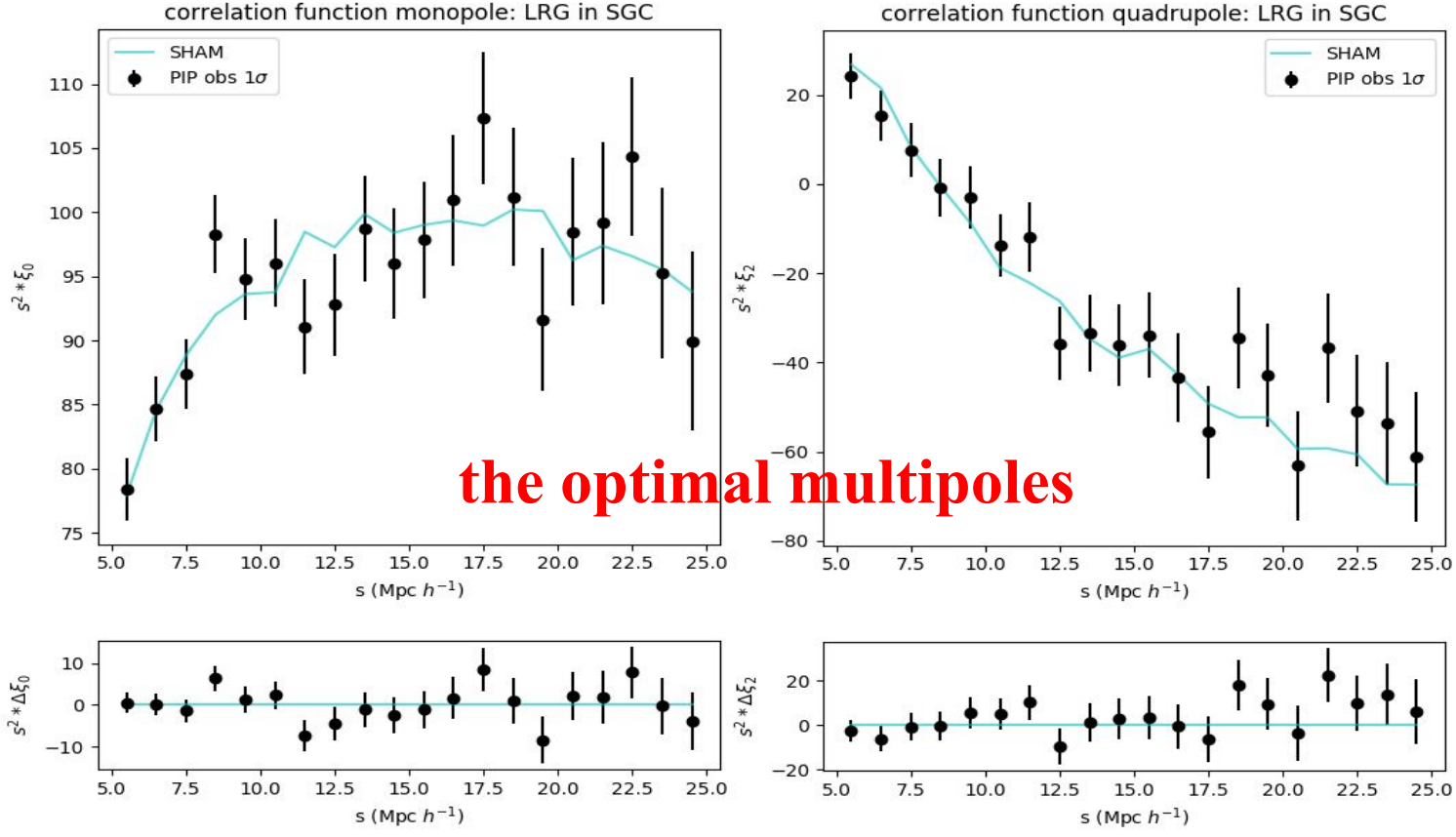
priors:	[0, 2.0]	[60,160]	[300,1500]	[0, 2.5]	[60, 160]	[1000, 1600]
optimal:	0.89	108	1326	0.99	105	1302
1σ interval:	[0.80, 1.75]	[85, 109]	[1259,1368]	[0.81, 2.17]	[86, 116]	[1254, 1365]
min chi2:		31.94			31.97	

SHAM for eBOSS LRG in SGC

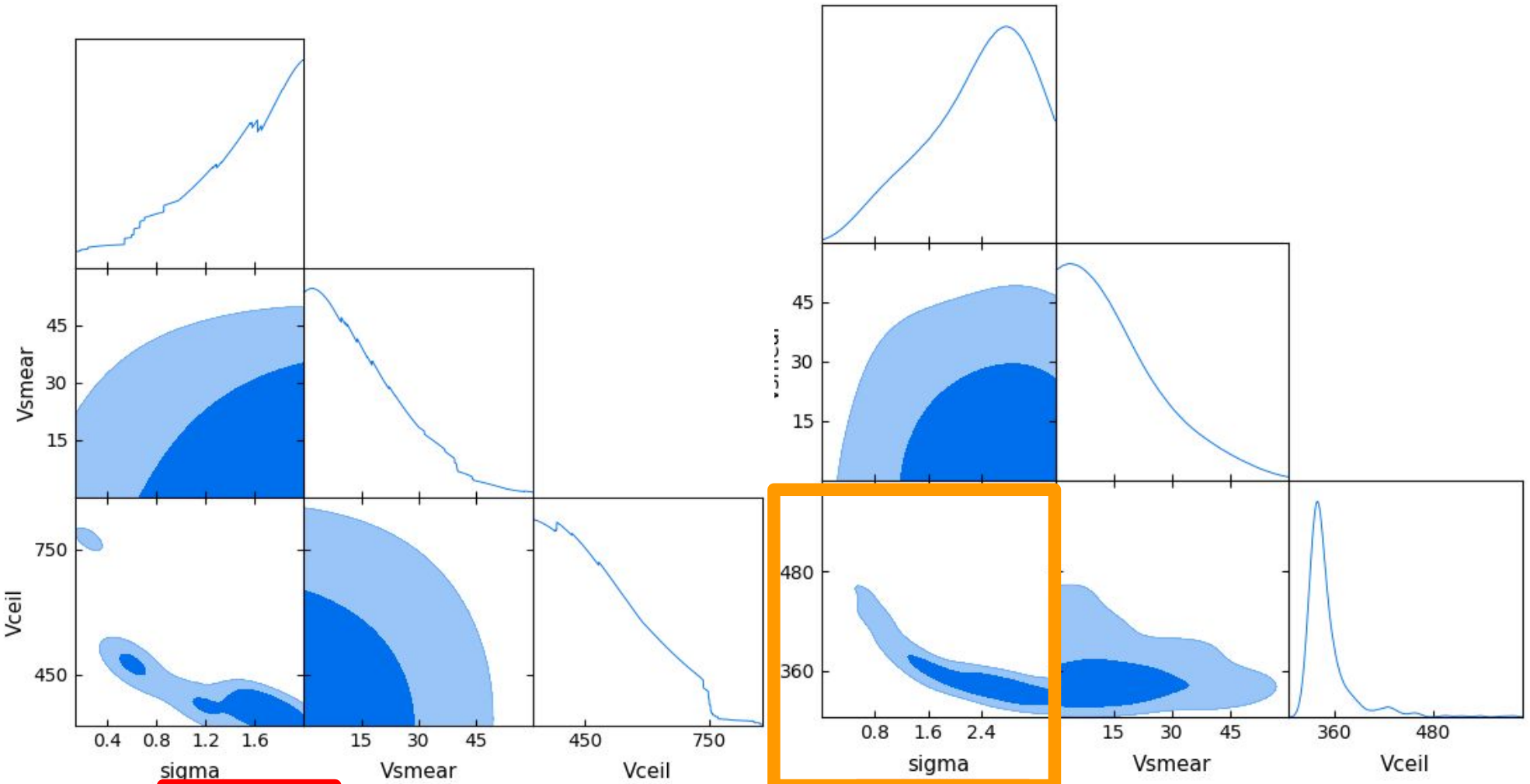
EPFL - LABORATOIRE D'ASTROPHYSIQUE

The optimal SHAM parameters:

1. BOSS SHAM give σ=0.31, but mine are **much larger**
2. **Vceil-σ posteriors** have an **"L" shape**
3. some optimal parameters are beyond the 1σ confidence interval



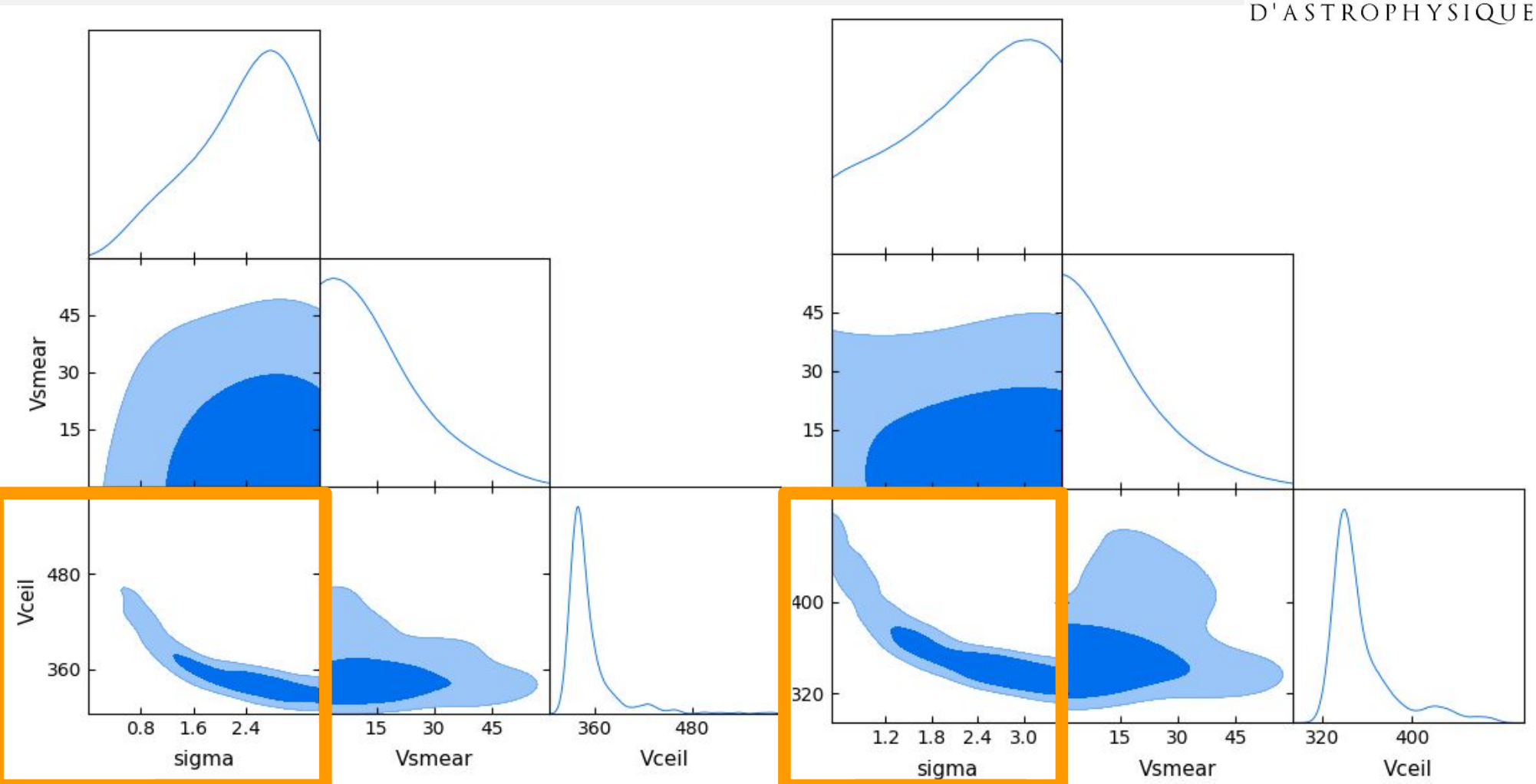
SHAM posteriors for ELG in SGC



priors:	[0, 2.0]	[0, 60]	[250, 2000]	[0, 3.5]	[0, 60]	[100, 600]
optimal:	1.74	8	360	3.08	7	334
1σ interval:	[0.48, 1.68]	[6, 35]	[364, 512]	[1.40, 3.05]	[5, 29]	[331, 370]
min chi2:	???	54.18		???	53.27	

SHAM posteriors for ELG in SGC

EPFL - LABORATOIRE D'ASTROPHYSIQUE



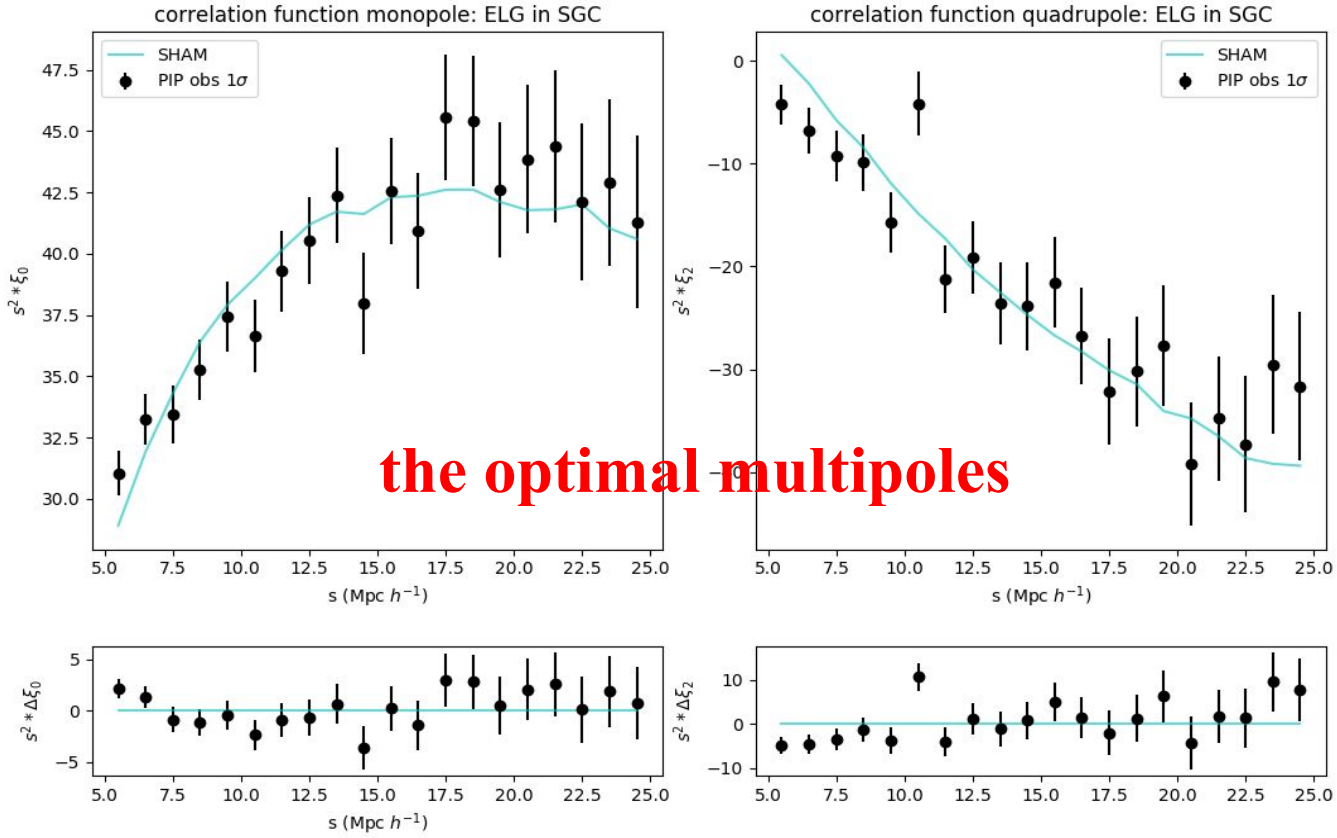
priors:	[0, 3.5]	[0, 60]	[100, 600]	[0.5, 3.5]	[0, 60]	[200, 500]
optimal:	3.08	7	334	3.09	10	334
1σ interval:	[1.40, 3.05]	[5, 29]	[331, 370]	[1.27, 3.10]	[4, 28]	[333, 378]
min chi2:		53.27			53.03	

SHAM for eBOSS ELG in SGC

EPFL - LABORATOIRE D'ASTROPHYSIQUE

The optimal SHAM parameters:

1. my σ is **much larger than 1,** i.e., a **random halo-galaxy relation**
2. **Vceil posteriors** have an **long tail**
3. some optimal parameters are beyond the 1σ confidence interval



the optimal multipoles