Itamar J. Allali, $^{1,\,*}$ Alessio Notari, $^{2,\,3,\,\dagger}$ and Fabrizio Rompineve $^{4,\,5,\,\ddagger}$

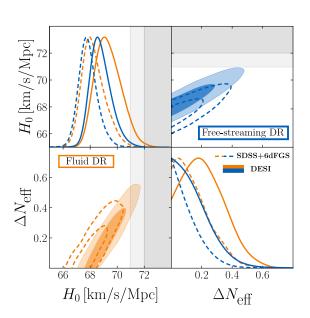
 $\sum m_{\nu} =$

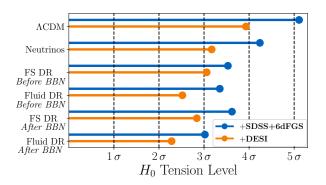
 $^{^{\}dagger} \begin{array}{l} notari@fqa.ub.edu \\ ^{\ddagger} \begin{array}{l} frompineve@ifae.es \end{array}$

 ${\tt MontePython};$

 \sum

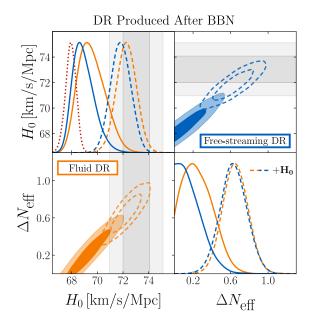
$\Delta N_{ m eff}$	< 0.386	$0.221^{+0.088}_{-0.18}$	0.06		
		69.35		$68.62^{+0.53}_{-0.76}$	$ 68.97^{+0.65}_{-0.93} $
H_0 GT	3.53σ	2.81σ	3.43σ	3.79σ	3.31σ
H_0 IT	3.06σ	2.52σ	3.24σ	3.4σ	2.93σ





e.g. [66].

$\Delta N_{ m eff}$	< 0.435	$0.26 (0.34)^{+0.11}_{-0.21}$	$0.63 \ (0.56) \pm 0.14$	$0.65 (0.73) \pm 0.13$
		$69.56 (69.82)_{-1.2}^{+0.85}$	$71.82 \ (71.65)^{+0.78}_{-0.77}$	$72.26 (73.0)_{-0.78}^{+0.77}$
H_0 GT	3.37σ	2.59σ	0.94σ	0.6σ
H_0 IT	2.84σ	2.28σ	0.94σ	0.6σ
$\Delta \chi^2$	~ 0	-0.4	-20.5	-24.7
ΔAIC	+2.0	+1.6	-18.5	-22.7



Remarkably, our findings also suggest that the

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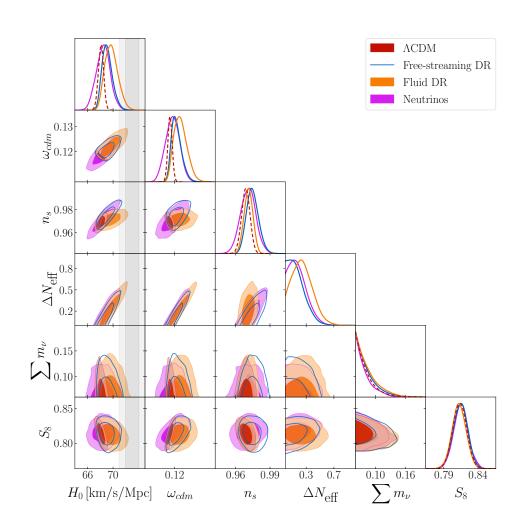
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$$\sqrt{\sigma_m^2 + \sigma_{ ext{MC}}^2}$$

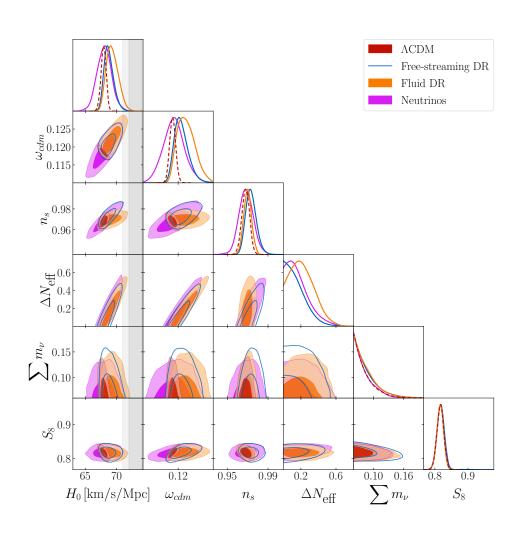
$$\int_{-\infty}^{\infty} \left(\left(\frac{h - \mu_m}{\sqrt{2}\sigma_m} \right) \right) \int_{-\infty}^{x^2} dx$$
 (A2)

$100\omega_b$	$2.249 \ (2.248)^{+0.013}_{-0.013}$	$2.262 (2.264)^{+0.016}_{-0.016}$	$2.272 (2.274)^{+0.017}_{-0.019}$	$2.256 (2.25)^{+0.019}_{-0.017}$
ω_{cdm}	$0.11811 \ (0.11823)^{+0.00087}_{-0.00086}$	$0.1208 (0.1212)^{+0.0015}_{-0.0024}$	$0.1224 \ (0.1205)^{+0.0021}_{-0.0031}$	$0.1193 \ (0.1176)^{+0.0024}_{-0.0028}$
$\ln 10^{10} A_s$	$3.054 (3.057)^{+0.014}_{-0.016}$	$3.062 (3.055)^{+0.015}_{-0.017}$	$3.052 (3.041)^{+0.015}_{-0.016}$	$3.058 (3.057)^{+0.015}_{-0.018}$
$ n_s $	$0.9689 (0.9689)^{+0.0036}_{-0.0036}$	$0.9748 (0.9742)^{+0.0047}_{-0.0057}$	$0.9712 (0.9678)^{+0.0039}_{-0.0039}$	$0.9713 (0.9715)^{+0.0064}_{-0.0065}$
$ au_{reio}$	$0.0608 (0.0608)^{+0.0070}_{-0.0081}$	$0.0614 (0.0595)^{+0.0072}_{-0.0083}$	$0.0619 \ (0.053)^{+0.0072}_{-0.0084}$	$0.0615 \ (0.0641)^{+0.0067}_{-0.0087}$
$\Delta N_{\alpha} \alpha$	_	< 0.395	$0.25 (0.13)^{+0.11}$	$0.12 (0.062)^{+0.16}_{-0.16}$
	10.42	10.66	10.87	
$H_0 \left[\text{km/s/Mpc} \right]$		$69.10 (68.91)_{-0.95}^{+0.66}$	$69.75 (69.19)_{-1.2}^{+0.87}$	$68.5 (68.4)_{-0.99}^{+1.1}$
S_8	$0.813 \ (0.818)^{+0.010}_{-0.010}$	$0.814 \ (2.483)^{+0.011}_{-0.011}$	$0.812 \ (0.809)^{+0.010}_{-0.010}$	$0.816 \ (0.807)^{+0.011}_{-0.010}$
H_0 GT	4.4σ	3.2σ	2.43σ	3.0σ
H_0 IT	4.12σ	2.81σ	2.17σ	3.08σ



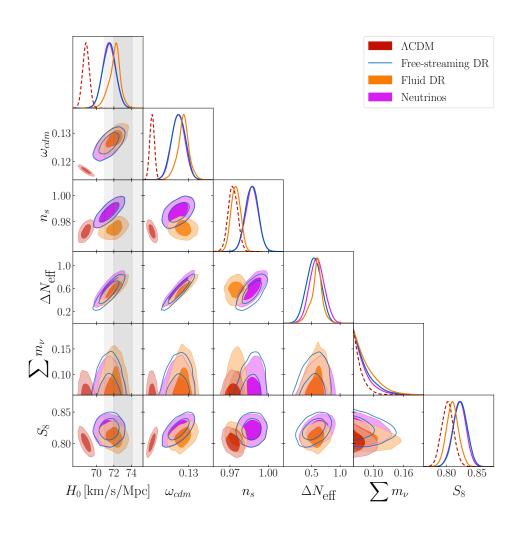
${\bf 2.} \quad {\bf P18+DESI+Pantheon_Plus}$

$100\omega_b$	$\begin{array}{c} 2.247 \ (2.251)^{+0.013}_{-0.013} \\ 0.11844 \ (0.11856)^{+0.00084}_{-0.00086} \\ 3.054 \ (3.061)^{+0.015}_{-0.0086} \end{array}$	$2.258 (2.246)^{+0.015}_{-0.016}$	$2.265 (2.257)_{-0.019}^{+0.017}$	$2.248 (2.256)^{+0.019}_{-0.018}$
ω_{cdm}	$0.11844 \ (0.11856)_{-0.00086}^{+0.00084}$	$0.1211 (0.1192)^{+0.0014}_{-0.0025}$	$0.1223 (0.1212)^{+0.0020}_{-0.0030}$	$0.1186 (0.1191)^{+0.0028}_{-0.0031}$
$\ln 10^{10} A_s$	$3.054 (3.061)_{-0.016}^{+0.015}$	$3.061 (3.039)_{-0.017}^{+0.014}$	$3.050 (3.055)^{+0.015}_{-0.015}$	$3.054 (3.052)^{+0.017}_{-0.018}$
$ n_s $	$0.9681 (0.9679)^{+0.0039}_{-0.0036}$	$0.9734 \ (0.9689)_{-0.0058}^{+0.0045}$	$0.9699 (0.9667)^{+0.0037}_{-0.0039}$	$0.9685 (0.9759)^{+0.0068}_{-0.0069}$
$ au_{reio}$	$0.0602 (0.0636)^{+0.0074}_{-0.0083}$	$0.0606 \ (0.0537)^{+0.0071}_{-0.0082}$	$0.0605 (0.0619)^{+0.0072}_{-0.0080}$	$0.0601 (0.0608)^{+0.0071}_{-0.0086}$
ΔN_{\sim} cr	_	< 0.386	$0.221 \ (0.128)^{+0.088}$	$0.06 \ (0.143)^{+0.17}_{-0.19}$
$H_0 \left[\text{km/s/Mpc} \right]$	$67.93 (68.07)_{-0.38}^{+0.44}$	$68.79 (67.99)_{-0.89}^{+0.60}$	$69.35 (68.72)_{-1.1}^{+0.81}$	$68.0 \ (67.14)^{+0.97}_{-1.2}$
S_8	$0.817 (0.822)^{+0.010}_{-0.010}$	$0.818 \ (0.436)^{+0.010}_{-0.011}$	$0.8161 \ (0.825)^{+0.0099}_{-0.0099}$	$0.817 \ (0.821)^{+0.011}_{-0.011}$
M_b	$-19.424 (-19.421)^{+0.013}_{-0.011}$	$-19.396 \ (-19.426)_{-0.028}^{+0.017}$	$-19.381 (-19.4)^{+0.024}_{-0.033}$	$\begin{bmatrix} -19.422 & (-19.448)^{+0.030}_{-0.036} \end{bmatrix}$
H_0 GT	4.53σ	3.53σ	2.81σ	3.54σ
H_0 IT	3.93σ	3.06σ	2.52σ	3.22σ



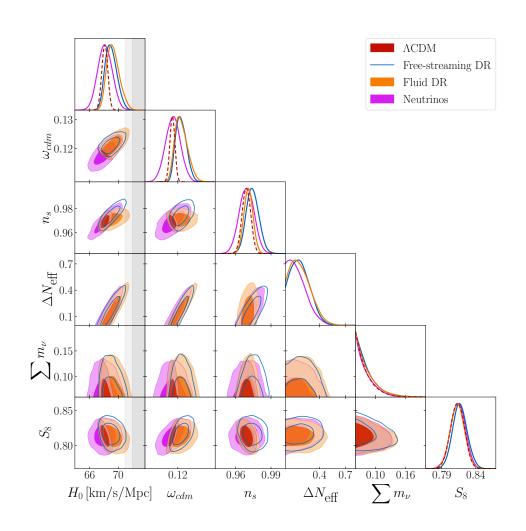
$3. \quad P18 + DESI + Pantheon_Plus + H_0$

$100\omega_b$	$2.264 \ (2.275)^{+0.013}_{-0.013}$	$2.290 (2.289)^{+0.015}_{-0.015}$	$2.304 \ (2.307)_{-0.015}^{+0.015}$	$2.291 (2.285)^{+0.014}_{-0.014}$
ω_{cdm}	$0.11682 (0.11669)^{+0.00083}_{-0.00083}$	$0.1263 (0.126)^{+0.0025}_{-0.0025}$	$0.1281 \ (0.1286)^{+0.0019}_{-0.0016}$	$0.1263 (0.1268)^{+0.0024}_{-0.0024}$
$\ln 10^{10} A_s$	$3.061 (3.07)_{-0.016}^{+0.015}$	$3.078 (3.079)_{-0.017}^{+0.015}$	$3.048 (3.042)_{-0.016}^{+0.015}$	$3.078 (3.065)_{-0.016}^{+0.016}$
n_s	$0.9723 \ (0.9732)_{-0.0036}^{+0.0037}$	$0.9871 \ (0.9867)_{-0.0050}^{+0.0049}$	$0.9746 \ (0.972)_{-0.0039}^{+0.0036}$	$0.9872 \ (0.9873)_{-0.0050}^{+0.0049}$
$ au_{reio}$	$0.0651 \ (0.0666)^{+0.0074}_{-0.0085}$	$0.0634 (0.0636)_{\substack{-0.0086\\-0.086}}^{\substack{+0.0072\\-0.0086}}$ $0.54 (0.52)_{\substack{+0.13\\-0.13}}^{\substack{+0.0072\\-0.0086}}$	$0.0633 \ (0.0588)^{+0.0074}_{-0.0077}$	$ \begin{array}{c c} 0.0633 & (0.0567)^{+0.0073}_{-0.0084} \\ 0.59 & (0.619)^{+0.12}_{-0.13} \end{array} $
ΔN_{\circ} cr	_	$0.54 (0.52)^{+0.13}$	$0.592 (0.611)^{+0.091}$	$0.59 (0.619)^{+0.12}_{-0.13}$
$H_0 \left[\text{km/s/Mpc} \right]$	$68.82 (68.98)^{+0.37}_{-0.39}$	$71.47 (71.39)^{+0.73}_{-0.76}$	$72.13 \ (72.25)^{+0.61}_{-0.41}$	$71.46 (71.79)_{-0.73}^{+0.73}$
S_8	$0.8017 (0.8045)^{+0.0096}_{-0.010}$	$0.822 \ (0.824)^{+0.011}_{-0.011}$	$0.8095 (0.8086)^{+0.0097}_{-0.010}$	$0.821 \ (0.819)^{+0.011}_{-0.011}$
M_b	$\begin{array}{c} 68.82\ (68.98)^{+0.37}_{-0.39} \\ 0.8017\ (0.8045)^{+0.0096}_{-0.010} \\ -19.398\ (-19.392)^{+0.011}_{-0.011} \end{array}$	$-19.320 \ (-19.319)_{-0.021}^{+0.021}$	$-19.301 \ (-19.295)^{+0.017}_{-0.011}$	$\begin{bmatrix} -19.320 & (-19.311)^{+0.021}_{-0.021} \end{bmatrix}$
H_0 GT	3.82σ	1.23σ	0.75σ	1.24σ
H_0 IT	3.8σ	1.23σ	0.76σ	1.24σ
$\Delta \chi^2$	_	-19.1	-23.8	-17.5
$\Delta { m AIC}$	_	-17.1	-21.8	-15.5



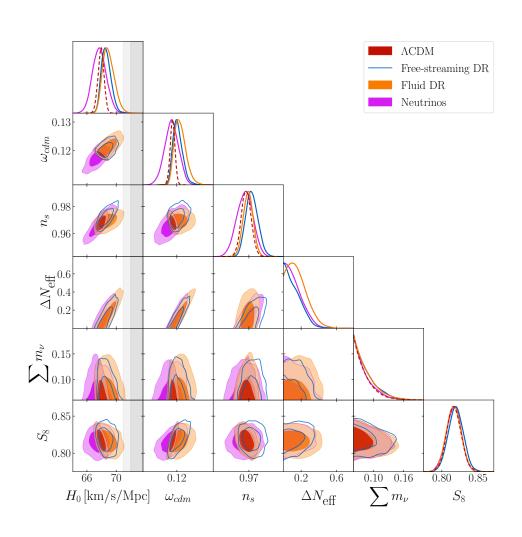
$\mathbf{4.}\quad \mathbf{P18} + \mathbf{DESI} + \mathbf{Y_{He}}, \mathbf{D}/\mathbf{H}$

$100\omega_b$	$2.249 (2.24)^{+0.013}_{-0.013}$	$2.254 (2.25)^{+0.015}_{-0.017}$	$2.266 (2.271)^{+0.016}_{-0.018}$	$2.250 (2.23)^{+0.017}_{-0.018}$
ω_{cdm}	$ \begin{vmatrix} 0.11812 & (0.11808) & +0.00089 \\ -0.00087 & 3.055 & (3.051) & +0.015 \\ -0.015 & -0.015 & -0.015 \end{aligned} $	$0.1212 (0.1206)^{+0.0016}_{-0.0021}$	$0.1212 (0.1205)^{+0.0018}_{-0.0026}$	$0.1183 \ (0.1166)_{-0.0026}^{+0.0026}$
$\ln 10^{10} A_s$	$3.055 (3.051)^{+0.015}_{-0.015}$	$3.061 (3.06)^{+0.015}_{-0.017}$	$3.053 (3.061)^{+0.015}_{-0.016}$	$3.055 (3.058)^{+0.016}_{-0.016}$
n_s	$\begin{array}{c} 0.9689 \; (0.9676) {}^{+0.0036}_{-0.0035} \\ 0.0610 \; (0.0587) {}^{+0.0071}_{-0.0082} \end{array}$	$0.9743 (0.9754)^{+0.0050}_{-0.0057}$	$0.9707 (0.9723)^{+0.0039}_{-0.0039}$	$0.9693 (0.9629)^{+0.0064}_{-0.0062}$
$ au_{reio}$	$0.0610 \ (0.0587)^{+0.0071}_{-0.0082}$	$ \begin{array}{c c} 0.0605 & (0.061) & +0.0072 \\ \hline 0.179 & (0.136) & +0.073 \\ \hline \end{array} $	$\begin{bmatrix} 0.0619 & (0.0642) & +0.0074 \\ -0.0083 & 0.182 & (0.148) & +0.061 \\ 0.0083 & 0.0083 & 0.0083 \end{bmatrix}$	$0.0611 (0.0655)^{+0.0071}_{-0.0083}$
$\Delta N_{\sim} \alpha$	_	$0.179 (0.136)^{+0.073}$	$0.182 (0.148)^{+0.061}$	$0.06 \ (-0.078)^{+0.16}_{-0.16}$
	10.40	10.70	1071	
$H_0 \left[\text{km/s/Mpc} \right]$	$68.09 (68.17)_{-0.41}^{+0.42}$	$69.00 (68.86)^{+0.69}_{-0.93}$	$69.30 (69.39)^{+0.71}_{-1.0}$	$68.2 (67.2)^{+1.0}$
S_8	$0.814 \ (0.814)^{+0.010}_{-0.010}$	$0.817 (1.829)^{+0.010}_{-0.011}$	$0.813 \ (0.816)^{+0.011}_{-0.010}$	$0.814 \ (0.822)^{+0.011}_{-0.011}$
H_0 GT	4.42σ	3.23σ	2.97σ	3.37σ
H_0 IT	3.95σ	2.99σ	2.66σ	3.31σ



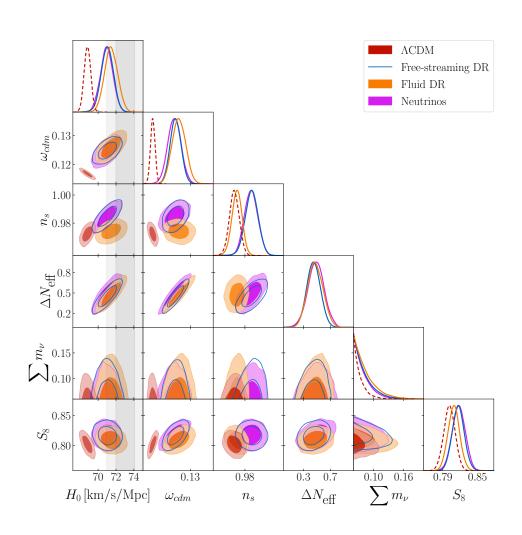
$5. \quad P18 + DESI + Y_{He}, D/H + Pantheon_Plus$

$100\omega_b$	$ \begin{array}{c} 2.247 \ (2.251)^{+0.014}_{-0.014} \\ 0.11845 \ (0.11833)^{+0.00084}_{-0.00084} \end{array} $	$2.254 (2.255)^{+0.014}_{-0.014}$	$2.260 (2.242)_{-0.016}^{+0.016}$	$2.249 (2.238)^{+0.015}_{-0.015}$
ω_{cdm}	$0.11845 (0.11833)^{+0.00084}_{-0.00084}$	$0.1203 \ (0.1196)_{-0.0020}^{+0.0013}$	$0.1213 \ (0.1187)^{+0.0016}_{-0.0024}$	$0.1191 \ (0.1183)^{+0.0015}_{-0.0025}$
$\ln 10^{10} A_s$	$3.053 (3.055)^{+0.014}_{-0.016}$	$3.059 (3.061)_{-0.017}^{+0.015}$	$3.052 (3.045)_{-0.015}^{+0.015}$	$3.055 (3.034)^{+0.015}_{-0.017}$
n_s	$0.9680 \ (0.9677)^{+0.0035}_{-0.0038}$	$0.9721 \ (0.9728)_{-0.0049}^{+0.0043}$	$0.9694 \ (0.9694)_{-0.0037}^{+0.0037}$	$0.9695 \ (0.9662)_{-0.0065}^{+0.0050}$
$ au_{reio}$	$0.0602 (0.0606)^{+0.0069}_{-0.0081}$	$0.0607 \ (0.0625)^{+0.0071}_{-0.0084}$	$0.0608 (0.058)^{+0.0071}_{-0.0082}$	$0.0599 \ (0.0519)^{+0.0070}_{-0.0082}$
ΔN_{\sim} cr	_	< 0.295	< 0.365	$0.087 (-0.007)^{+0.076}_{-0.15}$
			10.05	
$H_0 \left[\text{km/s/Mpc} \right]$	$67.92 (68.09)^{+0.41}_{-0.41}$	$68.58 (68.89)_{-0.69}^{+0.55}$	$68.97 (68.0)^{+0.65}_{-0.93}$	$68.13 \ (67.53)^{+0.68}_{-0.96}$
S_8	$0.817 \ (0.817)^{+0.010}_{-0.0098}$	$0.819 \ (0.816)^{+0.010}_{-0.011}$	$0.816 \ (0.819)^{+0.010}_{-0.010}$	$0.817 \ (0.818)^{+0.010}_{-0.0097}$
M_b	$-19.424 (-19.421)^{+0.012}_{-0.012}$	$-19.404 (-19.393)^{+0.016}_{-0.021}$	$-19.392 \ (-19.423)_{-0.028}^{+0.020}$	$-19.418 (-19.436)^{+0.020}_{-0.029}$
H_0 GT	4.58σ	3.8σ	3.31σ	3.96σ
H_0 IT	3.79σ	3.42σ	2.93σ	3.68σ



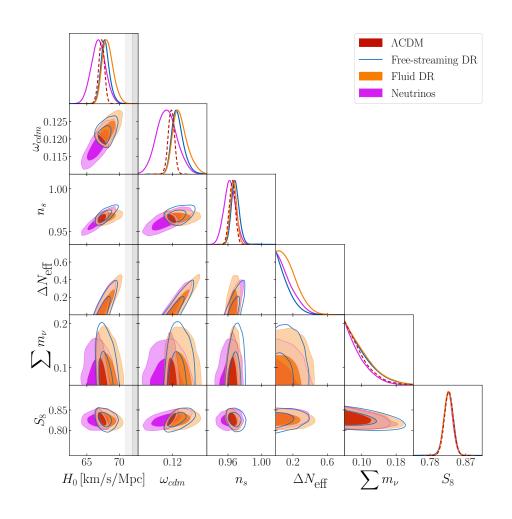
$6. \quad P18 + DESI + Y_{He}, D/H + Pantheon_Plus + H_0$

			,	
$100\omega_b$	$2.264 (2.273)^{+0.013}_{-0.013}$	$2.285 (2.28)_{-0.014}^{+0.014}$	$2.295 (2.296)_{-0.015}^{+0.015}$	$2.287 (2.284)^{+0.015}_{-0.014}$
ω_{cdm}	$0.11685 (0.11643)^{+0.00081}_{-0.00081}$	$0.1248 \ (0.1238)^{+0.0019}_{-0.0019}$	$0.1260 \ (0.1256)^{+0.0024}_{-0.0024}$	$0.1244 (0.1229)^{+0.0023}_{-0.0023}$
$\ln 10^{10} A_s$	$3.060 (3.068)_{-0.017}^{+0.015}$	$3.076 (3.057)_{-0.017}^{+0.015}$	$3.051 (3.042)^{+0.015}_{-0.017}$	$3.075 (3.063)^{+0.016}_{-0.017}$
n_s	$0.9723 \ (0.9721)_{-0.0036}^{+0.0035}$	$0.9849 \ (0.9825)^{+0.0048}_{-0.0047}$	$0.9742 \ (0.9747)_{-0.0037}^{+0.0037}$	$0.9844 \ (0.9832)_{-0.0049}^{+0.0050}$
$ au_{reio}$	$0.0647 (0.0677)^{+0.0073}_{-0.0084}$	$0.0635 (0.0557)^{+0.0071}_{-0.0087} 0.45 (0.38)^{+0.10}_{-0.0087}$	$0.0636 (0.0604)^{+0.0070}_{-0.0087}$ $0.48 (0.48)^{+0.11}_{-0.11}$	$\begin{array}{c} 0.0639 \ (0.0615) \begin{array}{c} -0.0074 \\ -0.0084 \\ 0.49 \ (0.431) \begin{array}{c} +0.0074 \\ -0.12 \end{array} \end{array}$
ΔN_{\sim} cr	_	$0.45 (0.38)^{+0.10}$	$0.48 (0.48)^{+0.11}$	$0.49 (0.431)^{+0.12}_{-0.12}$
$H_0 \left[\mathrm{km/s/Mpc} \right]$	$\begin{array}{c} 68.81 \ (69.12)^{+0.37}_{-0.37} \\ 0.8015 \ (0.8005)^{+0.0098}_{-0.0098} \end{array}$	$71.02 (70.59)^{+0.69}_{-0.67}$	$71.46 \ (71.78)^{+0.74}_{-0.72}$	$70.95 \ (71.06)^{+0.70}_{-0.70}$
S_8	$0.8015 (0.8005)^{+0.0098}_{-0.0098}$	$0.817 (2.701)_{-0.010}^{+0.010}$	$0.8090 \ (0.8007)^{+0.0099}_{-0.010}$	$0.817 (0.807)^{+0.011}_{-0.011}$
M_b	$-19.398 (-19.387)^{+0.011}_{-0.011}$	$-19.332 (-19.341)^{+0.019}_{-0.020}$	$-19.321 \ (-19.31)_{-0.021}^{+0.021}$	$\begin{bmatrix} -19.335 & (-19.332)^{+0.020}_{-0.020} \end{bmatrix}$
H_0 GT	3.83σ	1.62σ	1.24σ	1.67σ
H_0 IT	3.84σ	1.62σ	1.24σ	1.67σ
$\Delta \chi^2$	_	-12.7	-17.7	-10.5
$\Delta { m AIC}$	_	-10.7	-15.7	-8.5



$7. \quad P18+SDSS+6dFGS+Pantheon_Plus$

$100\omega_b$	$2.238 (2.253)^{+0.013}_{-0.013}$	$2.246 (2.248)^{+0.015}_{-0.015}$	$2.251 (2.252)_{-0.018}^{+0.016}$	$2.232 (2.23)^{+0.018}_{-0.018}$
ω_{cdm}	$[0.11964 (0.11931)^{+0.00090}_{-0.00089}]$	$0.1217 (0.1202)^{+0.0012}_{-0.0022}$	$0.1223 \ (0.1204)_{-0.0025}^{+0.0015}$	$0.1183 \ (0.1177)^{+0.0028}_{-0.0031}$
$\ln 10^{10} A_s$	$3.049 (3.053)^{+0.013}_{-0.015}$	$3.055 (3.049)^{+0.014}_{-0.016}$	$3.048 (3.048)^{+0.014}_{-0.016}$	$3.045 (3.051)^{+0.016}_{-0.016}$
n_s	$0.9652 (0.9653)^{+0.0036}_{-0.0037}$	$0.9691 \ (0.9698)_{-0.0053}^{+0.0039}$	$0.9666 \ (0.9656)^{+0.0038}_{-0.0038}$	$0.9621 \ (0.9615)^{+0.0069}_{-0.0068}$
$ au_{reio}$	$0.0572 (0.0578)^{+0.0067}_{-0.0075}$	$0.0570 \ (0.0563)^{+0.0069}_{-0.0078}$	$0.0577 (0.056)^{+0.0068}_{-0.0080}$	$0.0568 \ (0.0597)^{+0.0067}_{-0.0075}$
$\Delta N_{ m eff}$	_	< 0.312	< 0.285	$-0.04 \ (-0.061)_{-0.18}^{+0.18}$
$\sum m_{ u}$	< 0.152	< 0.174	< 0.169	< 0.146
$H_0 \left[\text{km/s/Mpc} \right]$	$67.27 (67.78)^{+0.43}_{-0.43}$	$67.84 (67.79)_{-0.75}^{+0.58}$	$68.25 (67.83)^{+0.69}_{-0.98}$	$66.8 (66.9)^{+1.1}$
S_8	$0.827 (0.826)^{+0.011}_{-0.011}$	$0.826 (5.249)^{+0.012}_{-0.012}$	$0.826 \ (0.828)^{+0.011}_{-0.011}$	$0.826 \ (0.826)^{+0.011}_{-0.011}$
M_b	$-19.443 (-19.43)^{+0.013}_{-0.013}$	$-19.421 \ (-19.426)_{-0.026}^{+0.015}$	$-19.412 \ (-19.427)^{+0.021}_{-0.030}$	$-19.458 \ (-19.455)_{-0.035}^{+0.034}$
H_0 GT	5.12σ	4.37σ	3.83σ	4.19σ
H_0 IT	5.11σ	3.53σ	3.35σ	4.24σ



Parameter	$P18+SDSS+6dFGS+Pantheon_Plus$	$P18+DESI+Pantheon_Plus$	
$100\omega_b$	$2.251 (2.241)^{+0.015}_{-0.017}$	$2.266 (2.263)^{+0.015}_{-0.019}$	$2.299 \ (2.305)^{+0.015}_{-0.015}$
ω_{cdm}	$0.1228 (0.1219)^{+0.0018}$	$0.1229 (0.1254)^{+0.0023}$	$0.1291 (0.1303)^{+0.0028}_{-0.0028}$
$\ln 10^{10} A_s$	$3.047 (3.049)^{+0.015}_{-0.015}$	$3.049 (3.041)_{-0.015}^{+0.015}$	$3.045 (3.053)^{+0.016}$
	$\begin{array}{c} 3.047 \ (3.049) \substack{+0.015 \\ -0.015} \\ 0.9658 \ (0.9652) \substack{+0.0038 \\ -0.0037} \end{array}$	$\begin{array}{c} 3.049 \ (3.041)^{+0.015}_{-0.0037} \\ 0.9689 \ (0.9666)^{+0.0037}_{-0.0037} \end{array}$	$0.9716 (0.9759)^{+0.0035}_{-0.0035}$
$ au_{reio}$	$0.0575 (0.057)^{+0.0069}_{-0.0075}$	$0.0607 (0.057)^{+0.0071}_{-0.0081}$	$\begin{array}{c} 0.9716 \ (0.9759) {}^{+0.0035}_{-0.0035} \\ 0.0627 \ (0.0679) {}^{+0.0073}_{-0.0083} \\ 0.65 \ (0.73) {}^{+0.13}_{-0.14} \end{array}$
$\Delta N_{ m eff}$	< 0.433		$0.65 (0.73)^{+0.13}_{-0.14}$
$\sum m_{ u}$	< 0.166	< 0.137	< 0.149
$H_0 \left[\text{km/s/Mpc} \right]$	$\begin{array}{c} 68.39 \ (67.94)^{+0.71}_{-1.1} \\ 0.826 \ (0.834)^{+0.011}_{-0.011} \end{array}$	$\begin{array}{c} 69.56 \ (69.82)^{+0.85}_{-1.2} \\ 0.815 \ (0.825)^{+0.010}_{-0.011} \end{array}$	$72.25 (73.0)_{-0.79}^{+0.79} 0.809 (0.812)_{-0.011}^{+0.011}$
S_8	$0.826 (0.834)^{+0.011}_{-0.011}$	$0.815 (0.825)^{+0.010}_{-0.011}$	$0.809 \ (0.812)^{+0.011}_{-0.011}$
M_b	$-19.408 (-19.42)^{+0.022}_{-0.033}$	$-19.374 \ (-19.365)_{-0.037}^{+0.026}$	$-19.298 \ (-19.276)_{-0.021}^{+0.024}$
H_0 GT	3.69σ		0.6σ
H_0 IT	3.02σ		0.6σ
$\Delta \chi^2$	~ 0	-0.4	-24.7
$\Delta { m AIC}$	+2.0	+1.6	-22.7

TABLE X: Marginalized posteriors for various model parameters for the Fluid DR model where the $P18+DESI+Pantheon_Plus$, and $P18+DESI+Pantheon_Plus+H_0$. All upper bounds are reported at 95% C.L., for any case where the 1σ lower bound is overlapping with our priors.

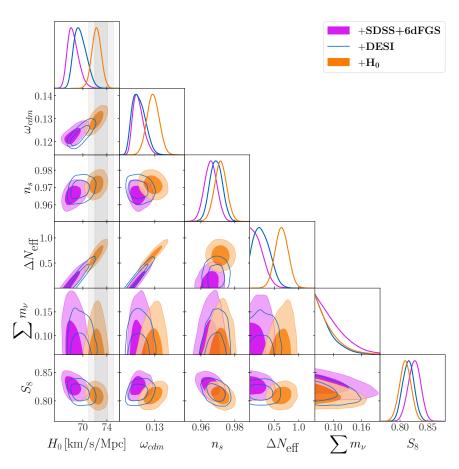


FIG. 11: One and two-dimensional posterior distributions for various model parameters for the Fluid DR model $P18+DESI+Pantheon_Plus$, and $P18+DESI+Pantheon_Plus+H_0$.

Parameter	$P18+SDSS+6dFGS+Pantheon_Plus$		$\boxed{ P18 + DESI + Pantheon_Plus + H_0 }$
$100\omega_b$	$\begin{array}{c} 2.245 \ (2.24)^{+0.015}_{-0.014} \\ 0.1219 \ (0.1218)^{+0.0014}_{-0.0024} \\ 3.054 \ (3.041)^{+0.015}_{-0.016} \\ 0.9688 \ (0.9676)^{+0.0043}_{-0.0050} \end{array}$	$\begin{array}{c} 2.257 \ (2.254)^{+0.015}_{-0.015} \\ 0.1214 \ (0.1193)^{+0.0016}_{-0.0027} \\ 3.060 \ (3.059)^{+0.014}_{-0.0045} \\ 0.9731 \ (0.9732)^{+0.0045}_{-0.0055} \\ 0.0602 \ (0.0623)^{+0.0051}_{-0.0081} \end{array}$	$2.288 \ (2.278)^{+0.014}_{-0.014}$
ω_{cdm}	$0.1219 \ (0.1218)^{+0.0014}_{-0.0024}$	$0.1214 \ (0.1193)^{+0.0016}_{-0.0027}$	$\begin{array}{c} 0.1278 \; (0.1287) {}^{+0.0026}_{-0.0026} \\ 3.077 \; (3.071) {}^{+0.014}_{-0.017} \\ 0.9864 \; (0.987) {}^{+0.0044}_{-0.00470} \end{array}$
$\ln 10^{10} A_s$	$3.054 (3.041)_{-0.016}^{+0.015}$	$3.060 (3.059)^{+0.014}_{-0.017}$	$3.077 (3.071)^{+0.014}_{-0.017}$
	$0.9688 \ (0.9676)^{+0.0043}_{-0.0050}$	$0.9731 \ (0.9732)_{-0.0055}^{+0.0045}$	$0.9864 \ (0.987)^{+0.0044}_{-0.0047}$
$ au_{reio}$	$0.0568 (0.0493)^{+0.0068}_{-0.0079}$	$0.0602 (0.0623)^{+0.0071}_{-0.0081}$	$\begin{array}{c} 0.0622 \ (0.0584) \begin{array}{c} -0.0047 \\ +0.0069 \\ -0.0084 \\ 0.63 \ (0.65) \begin{array}{c} +0.14 \\ -0.14 \end{array} \end{array}$
$\Delta N_{ m eff}$	< 0.353	< 0.435	$0.63 (0.65)_{-0.14}^{+0.14}$
$\sum m_{ u}$	< 0.161	< 0.129	< 0.137
$H_0 \left[\mathrm{km/s/Mpc} \right]$	$68.03 (68.17)_{-0.84}^{+0.57}$	$\begin{array}{c} 68.94 \ (68.41)^{+0.63}_{-0.99} \\ 0.821 \ (0.822)^{+0.011}_{-0.011} \end{array}$	$71.82 \ (71.65)^{+0.78}_{-0.77}$
S_8	$0.830 \ (0.826)^{+0.011}_{-0.011}$	$0.821 (0.822)^{+0.011}_{-0.011}$	$0.823\ (0.83)_{-0.011}^{+0.011}$
M_b	$-19.419 \left(-19.414\right)_{-0.026}^{+0.017}$	$-19.393 (-19.41)^{+0.019}_{-0.030}$	$-19.310 \; (-19.311)^{+0.022}_{-0.022}$
H_0 GT	4.22σ		0.94σ
H_0 IT	3.62σ		0.94σ
$\Delta \chi^2$	~ 0	+0.4	-20.5
$\Delta { m AIC}$	+2.0	+2.4	-18.5

