

first look at an

# update of world average $\alpha_s(M_Z)$ (Feb. 2011)

(n.b.: preliminary; incomplete!)

→  $\alpha_s(M_Z) = 0.1174 \pm 0.0006$  ( $\chi^2 = 27 / 7 \text{ d.f.}$ )

→  $\alpha_s(M_Z) = 0.1174 \pm 0.0011$  ( $\chi^2 = 1/\text{d.f.}$ )

new



Process	Q [GeV]	$\alpha_s(Q)$	$\alpha_s(M_{Z^0})$	excl. mean $\alpha_s(M_{Z^0})$	std. dev.
$\tau$ -decays	1.78		$0.1213 \pm 0.0014$	$0.1167 \pm 0.0009$	2.7
DIS [ $F_2$ ]	2 - 170	–	$0.1142 \pm 0.0023$	$0.1174 \pm 0.0011$	1.3
DIS [e-p → jets]	6 - 100	–	$0.1198 \pm 0.0032$	$0.1172 \pm 0.0011$	0.8
$Q\bar{Q}$ states	7.5	$0.1923 \pm 0.0024$	$0.1183 \pm 0.0008$	$0.1166 \pm 0.0013$	1.1
$\Upsilon$ decays	9.46	$0.184^{+0.015}_{-0.014}$	$0.119^{+0.006}_{-0.005}$	$0.1174 \pm 0.0011$	0.3
$e^+e^-$ [T, Hoang]	34 - 208	–	$0.1135 \pm 0.0010$	$0.1185 \pm 0.0007$	4.1
$e^+e^-$ [ew prec. data]	91.2	$0.1193 \pm 0.0028$	$0.1193 \pm 0.0028$	$0.1172 \pm 0.0011$	0.7
$e^+e^-$ [jets, Dissert.]	91 - 208	–	$0.1175 \pm 0.0015$	$0.1172 \pm 0.0011$	0.2

- n.b.:
- *incompatible* „raw“ summary
  - one result *incompatible* with rest
  - $\chi^2 = 1$  only if **all** errors inflated by factor 2.0

second look at an  
 update of world average  $\alpha_s(M_Z)$  (Feb. 2011)  
 (n.b.: preliminary; incomplete!)

→  $\alpha_s(M_Z) = 0.1187 \pm 0.0006$  ( $\chi^2 = 8 / 8$  d.f.)

new  
↓

Process	Q [GeV]	$\alpha_s(Q)$	$\alpha_s(M_{Z^0})$	excl. mean $\alpha_s(M_{Z^0})$	std. dev.
$\tau$ -decays	1.78		$0.1209 \pm 0.0014$	$0.1182 \pm 0.0010$	1.6
DIS [ $F_2$ ]	2 - 170	–	$0.1142 \pm 0.0023$	$0.1190 \pm 0.0011$	1.9
DIS [e-p → jets]	6 - 100	–	$0.1198 \pm 0.0032$	$0.1186 \pm 0.0007$	0.4
$Q\bar{Q}$ states	7.5	$0.1923 \pm 0.0024$	$0.1183 \pm 0.0008$	$0.1192 \pm 0.0009$	0.7
$\Upsilon$ decays	9.46	$0.184^{+0.015}_{-0.014}$	$0.119^{+0.006}_{-0.005}$	$0.1187 \pm 0.0006$	0.1
$e^+e^-$ [JADE]	14 - 44	–	$0.1172 \pm 0.0051$	$0.1187 \pm 0.0006$	0.3
$e^+e^-$ [ew prec. data]	91.2	$0.1193 \pm 0.0028$	$0.1193 \pm 0.0028$	$0.1186 \pm 0.0007$	0.2
$e^+e^-$ [LEP, A+O]	91 - 208	–	$0.1220 \pm 0.0034$	$0.1186 \pm 0.0006$	0.6
$p\bar{p}$ D0 incl. jets		–	$0.1161 \pm 0.0045$	$0.1187 \pm 0.0006$	0.6

→  
→

- n.b.: - *tau-result o.k.? (here: T. Pich)*  
 - shapes from LEP: OPAL & ALEPH  
 - lattice: only one result?