

$$\left\{ \begin{array}{l}
\sigma_{pp} = Z_{pp} + B \ln^2 \left(\frac{s}{s_0} \right) + Y_1^{pp} s^{-\eta} - Y_2^{pp} s^{-\eta}, \\
\sigma_{\bar{p}p} = Z_{pp} + B \ln^2 \left(\frac{s}{s_0} \right) + Y_1^{pp} s^{-\eta} + Y_2^{pp} s^{-\eta}, \\
\sigma_{\pi+p} = Z_{\pi p} + B \ln^2 \left(\frac{s}{s_0} \right) + Y_1^{\pi p} s^{-\eta} - Y_2^{\pi p} s^{-\eta}, \\
\sigma_{\pi-p} = Z_{\pi p} + B \ln^2 \left(\frac{s}{s_0} \right) + Y_1^{\pi p} s^{-\eta} + Y_2^{\pi p} s^{-\eta}, \\
\sigma_{K+p} = Z_{Kp} + B \ln^2 \left(\frac{s}{s_0} \right) + Y_1^{Kp} s^{-\eta} - Y_2^{Kp} s^{-\eta}, \\
\sigma_{K-p} = Z_{Kp} + B \ln^2 \left(\frac{s}{s_0} \right) + Y_1^{Kp} s^{-\eta} + Y_2^{Kp} s^{-\eta}, \\
\sigma_{\gamma p} = \delta \left[Z_{\gamma p} + B \ln^2 \left(\frac{s}{s_0} \right) \right] + Y_1^{\gamma p} s^{-\eta}, \\
\sigma_{\gamma\gamma} = \delta^2 \left[Z_{\gamma\gamma} + B \ln^2 \left(\frac{s}{s_0} \right) \right] + Y_1^{\gamma\gamma} s^{-\eta}, \\
\sigma_{\Sigma-p} = Z_{\Sigma p} + B \ln^2 \left(\frac{s}{s_0} \right) + Y_1^{\Sigma p} s^{-\eta}. \quad \blacksquare \\
\rho_{pp}\sigma_{pp} = \pi B \ln \left(\frac{s}{s_0} \right) - \frac{Y_1^{pp} s^{-\eta}}{\tan \left[\frac{1-\eta}{2} \pi \right]} - \frac{Y_2^{pp} s^{-\eta}}{\cot \left[\frac{1-\eta}{2} \pi \right]}, \\
\rho_{\bar{p}p}\sigma_{\bar{p}p} = \pi B \ln \left(\frac{s}{s_0} \right) - \frac{Y_1^{pp} s^{-\eta}}{\tan \left[\frac{1-\eta}{2} \pi \right]} + \frac{Y_2^{pp} s^{-\eta}}{\cot \left[\frac{1-\eta}{2} \pi \right]}, \\
\rho_{\pi+p}\sigma_{\pi+p} = \pi B \ln \left(\frac{s}{s_0} \right) - \frac{Y_1^{\pi p} s^{-\eta}}{\tan \left[\frac{1-\eta}{2} \pi \right]} - \frac{Y_2^{\pi p} s^{-\eta}}{\cot \left[\frac{1-\eta}{2} \pi \right]}, \\
\rho_{\pi-p}\sigma_{\pi-p} = \pi B \ln \left(\frac{s}{s_0} \right) - \frac{Y_1^{\pi p} s^{-\eta}}{\tan \left[\frac{1-\eta}{2} \pi \right]} + \frac{Y_2^{\pi p} s^{-\eta}}{\cot \left[\frac{1-\eta}{2} \pi \right]}, \\
\rho_{K+p}\sigma_{K+p} = \pi B \ln \left(\frac{s}{s_0} \right) - \frac{Y_1^{Kp} s^{-\eta}}{\tan \left[\frac{1-\eta}{2} \pi \right]} - \frac{Y_2^{Kp} s^{-\eta}}{\cot \left[\frac{1-\eta}{2} \pi \right]}, \\
\rho_{K-p}\sigma_{K-p} = \pi B \ln \left(\frac{s}{s_0} \right) - \frac{Y_1^{Kp} s^{-\eta}}{\tan \left[\frac{1-\eta}{2} \pi \right]} + \frac{Y_2^{Kp} s^{-\eta}}{\cot \left[\frac{1-\eta}{2} \pi \right]},
\end{array} \right.$$

Variable s is in the units [GeV^2]. The additional scale $s_1 = 1$ [GeV^2] in terms with $(s/s_1)^{-\eta}$ is omitted for brevity.

Adjustable parameters naming. In total 19 parameters used:

$$\begin{aligned}
 \eta, \delta & - \text{dimensionless} \\
 Z_{pp}, Z_{\pi p}, Z_{Kp}, Z_{\Sigma p}, Z_{\gamma p}, Z_{\gamma\gamma}, B & - [\text{mb}] \\
 s_0 & - [\text{GeV}^2] \\
 Y_{1,2}^{pp}, Y_{1,2}^{\pi p}, Y_{1,2}^{Kp}, Y_1^{\Sigma p}, Y_1^{\gamma p}, Y_1^{\gamma\gamma} & - [\text{mb}]
 \end{aligned}$$

Scan-fits summary. 2000 database. Without cosmic data points.

$E_{\text{cm}}^{\text{min}}$ [GeV]	3	4	5	6	7	8	9	10
N_{dof} : ρ excluded	707	562	488	415	350	312	266	211
N_{dof} : ρ included	885	723	629	560	479	434	378	310
χ^2/dof : ρ excluded	1.27	0.99	0.82	0.80	0.83	0.83	0.82	0.75
χ^2/dof : ρ included	1.96	1.26	0.99	0.99	0.98	0.93	0.93	0.93

Details of the fit to the data in the whole domain of applicability

			χ^2/dof	=	0.995
			CL[%]	=	53.15
			Name of value	Numerical value	Error value
Breakdown of the CS data sample			s_0	49.056427	4.6172475
pp :	5.00963	112	η	0.53076334	0.0059203784
$\bar{p}p$:	5.1569	59	Z_{pp}	37.046665	0.14820915
π^+p :	5.21275	50	$Z_{\pi p}$	22.094486	0.14102222
π^-p :	5.02954	106	Z_{Kp}	18.941502	0.13998954
K^+p :	5.12707	40	$Z_{\Sigma p}$	33.0569	0.43528134
K^-p :	5.10875	63	$Z_{\gamma p}$	29.28947	2.8563214
Σ^-p :	6.12189	9	$Z_{\gamma\gamma}$	19.937208	4.5590042
γp :	5.01008	38	δ	0.0038096263	0.00035563171
$\gamma\gamma$:	5.	30	B	0.32765691	0.0081457393
Breakdown of the ρ data sample			Y_{pp1}	44.317753	1.2312145
pp :	5.30542	74	Y_{pp2}	30.819292	0.8311592
$\bar{p}p$:	11.5382	11	$Y_{\pi p1}$	16.299311	0.99512835
π^+p :	8.98072	8	$Y_{\pi p2}$	5.514108	0.14527497
π^-p :	7.56285	30	Y_{Kp1}	2.0106621	1.1025517
K^+p :	5.21771	10	Y_{Kp2}	12.600861	0.33474977
K^-p :	5.23565	8	$Y_{\Sigma p1}$	-3.4486615	6.6047133
			$Y_{\gamma p1}$	0.024180593	0.007669911
			$Y_{\gamma\gamma1}$	0.00028571116	0.0001666682

Model quality indicators:

	A^M	C_1^M	C_2^M	U^M	R_1^M	R_2^M	S_1^M	S_2^M
(RR) ^d PL2 _u (19)	2.188	53.15	83.81	16.49	32.40	0.871	0.286	0.690

Repository:

computer - NPT1

directory - d:\MathemD\Kolja\Evela\Gauron\ (RR)dPL2u(19)

Appendix (RR)^dPL2_u(19) (N^o26) χ^2/NoP by data samples

	CS data								
Reaction	pp	$\bar{p}p$	π^+p	π^-p	K^+p	K^-p	Σ^-p	γp	$\gamma\gamma$
χ^2/NoP	0.86	1.22	0.79	0.84	0.72	0.62	0.77	0.61	0.51

	ρ data					
Reaction	pp	$\bar{p}p$	π^+p	π^-p	K^+p	K^-p
χ^2/NoP	1.98	0.56	1.64	1.15	0.79	1.00

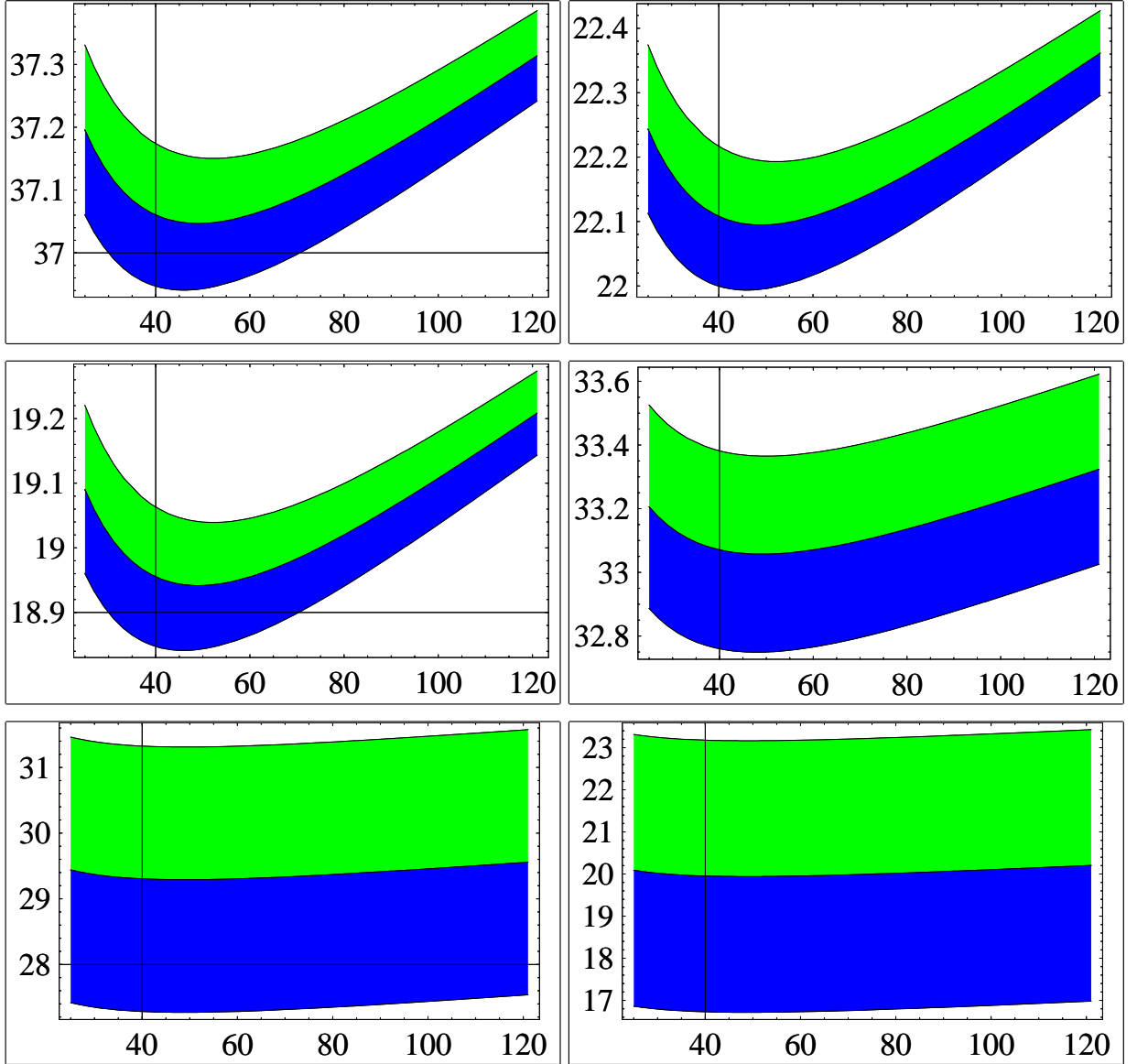


Figure 9: Pomeron contribution for pp , π^+p , K^+p , Σ^-p , γp , $\gamma\gamma$ [mb] (Axis $X - s$ [GeV^2])

	s_0	η	Z_{pp}	$Z_{\pi p}$	Z_{Kp}	$Z_{\Sigma p}$	$Z_{\gamma p}$	$Z_{\gamma\gamma}$	δ	B	Y_{pp1}	Y_{pp2}	$Y_{\pi p1}$	$Y_{\pi p2}$	Y_{Kp1}	Y_{Kp2}	$Y_{\Sigma p1}$	$Y_{\Sigma p2}$	$Y_{\gamma p1}$	$Y_{\gamma p2}$	$Y_{\gamma\gamma 1}$	$Y_{\gamma\gamma 2}$	
s_0	100	27.6	95	97.3	97.5	32	5.68	4.06	-0.935	93.4	-63.5	27.9	-96.3	17.9	-95.8	24	-17.4	-17.4	-51.6	-17.4	-9.1	-9.1	
η	27.6	100	42.5	41.9	31	8.84	0.152	-0.117	1.47	15.2	49.8	97	-9.07	86.7	93.6	-5.85	-5.85	-10.2	-10.2	0.614	0.614		
Z_{pp}	95	42.5	100	96.7	95.1	31.3	3.77	2.35	0.864	80.7	-55.9	41.5	-90	30.9	-92.9	37.9	-17.4	-17.4	-48.4	-17.4	-7.74	-7.74	
$Z_{\pi p}$	97.3	41.9	96.7	100	96.4	31.6	4.63	3.13	0.0678	86.2	-52.4	41.5	-94	29.8	-94.2	37.4	-17.4	-17.4	-49.6	-17.4	-8.17	-8.17	
Z_{Kp}	97.5	31	95.1	96.4	100	31.7	4.7	3.19	-0.0277	87.2	-60.8	30.9	-94	20.7	-99.2	27.2	-17.4	-17.4	-50.2	-17.4	-8.53	-8.53	
$Z_{\Sigma p}$	32	8.84	31.3	31.6	31.7	100	1.45	0.958	0.0856	28.2	-21.2	8.83	-31.2	5.58	-31.2	7.63	-96.5	-96.5	-16.5	-16.5	-2.82	-2.82	
$Z_{\gamma p}$	5.68	0.152	3.77	4.63	4.7	1.45	100	98.6	98.6	8.04	-3.21	0.388	-5.06	-0.0136	-4.64	0.129	-0.695	-0.695	-53.8	-53.8	-56.2	-56.2	
$Z_{\gamma\gamma}$	4.06	-0.117	2.35	3.13	3.19	0.958	98.6	100	-98.6	6.35	-2.15	0.0969	-3.51	-0.16	-3.15	-0.0992	-0.433	-0.433	-49.4	-49.4	-66	-66	
δ	-0.935	1.47	0.864	0.0678	-0.0277	0.0856	-98.6	100	100	-3.78	0.357	1.23	0.517	1.13	0.0566	1.3	-0.149	-0.149	48.5	48.5	55.9	55.9	
B	93.4	15.2	80.7	86.2	87.2	28.2	8.04	6.35	-3.78	100	-60.6	16.6	-88.9	8.32	-85.9	12.9	-14.9	-14.9	-48.5	-48.5	-9.51	-9.51	
Y_{pp1}	-63.5	49.8	-55.9	-52.4	-60.8	-21.2	-3.21	-2.15	0.357	-60.6	100	51	75.5	48.8	62.7	48.4	11	11	35.8	35.8	7.68	7.68	
Y_{pp2}	27.9	97	41.5	41.5	30.9	8.83	0.388	0.0969	1.23	16.6	51	100	-9.75	84.1	-26.6	90.8	-5.78	-5.78	-10.5	-10.5	0.438	0.438	
$Y_{\pi p1}$	-96.3	-9.07	-90	-94	-94	-31.2	-5.06	-3.51	0.517	-88.9	75.5	-9.75	100	-2.02	93.2	-6.5	16.9	16.9	50.5	50.5	9.18	9.18	
$Y_{\pi p2}$	17.9	86.7	30.9	29.8	20.7	5.58	-0.0136	-0.16	1.13	8.32	48.8	84.1	-2.02	100	-16.9	81.4	-3.92	-3.92	-5.66	-5.66	1.09	1.09	
Y_{Kp1}	-95.8	-26.6	-92.9	-94.2	-99.2	-31.2	-4.64	-3.15	0.0566	-85.9	62.7	-26.6	93.2	-16.9	100	-23.8	17.1	17.1	49.5	49.5	8.51	8.51	
Y_{Kp2}	24	93.6	37.9	37.4	27.2	7.63	0.129	-0.0992	1.3	12.9	48.4	90.8	-6.5	81.4	100	-5.11	-5.11	-8.61	-8.61	0.735	0.735		
$Y_{\Sigma p1}$	-17.4	-5.85	-17.4	-17.4	-17.4	-16.5	-0.695	-0.433	-0.149	-14.9	11	-5.78	16.9	-3.92	17.1	-5.11	100	100	8.96	8.96	1.48	1.48	
$Y_{\Sigma p2}$	-51.6	-10.2	-48.4	-49.6	-50.2	-16.5	-53.8	-49.4	48.5	-48.5	35.8	-10.5	50.5	-5.66	49.5	-8.61	8.96	8.96	100	100	31.7	31.7	
$Y_{\gamma p1}$	-9.1	0.614	-7.74	-8.17	-8.53	-2.82	-56.2	-66	55.9	-9.51	7.68	0.438	9.18	1.09	8.51	0.735	1.48	1.48	31.7	31.7	100	100	
$Y_{\gamma p2}$																							

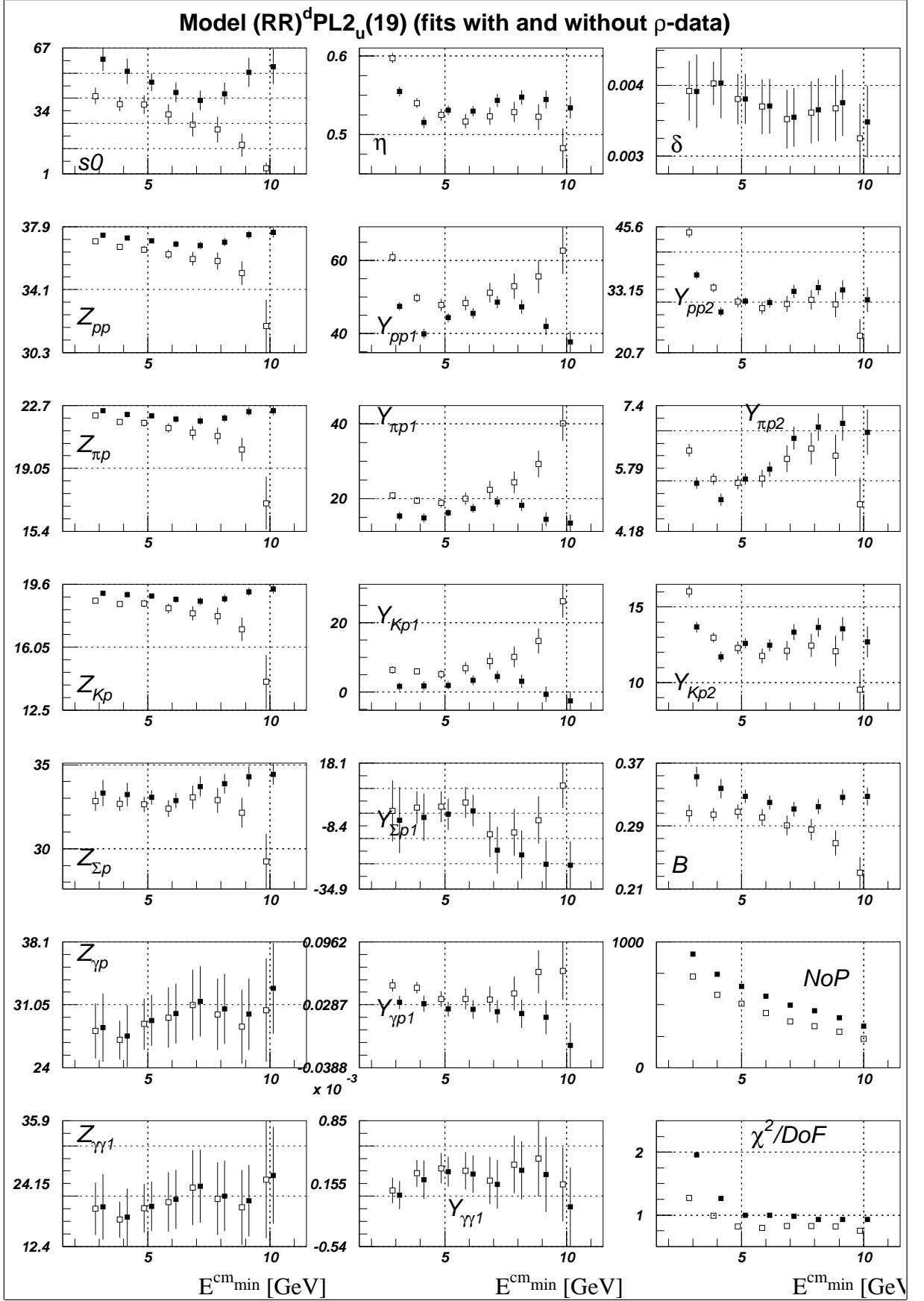


Figure 10: Bold (empty) symbol marks fits with (without) ρ data and are shifted to the right (left) in energy slightly for the cleareness

