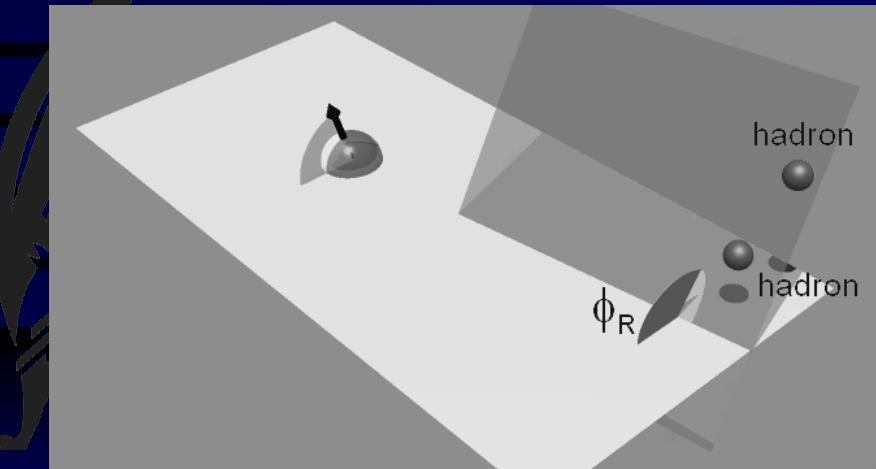


## Hadron pair azimuthal angle



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## Center of mass angle

Center of mass  
direction in  
lab frame

hadron decay plane

Center of mass frame

$\pi$

$\theta_R$

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## Polarized $\Lambda$ production

$$d^7\sigma^\uparrow + d^7\sigma^\downarrow \propto \left(1 - y + \frac{y^2}{2}\right) f_1(x) D_1(z) \mathcal{B}W(M^2; M_\Lambda^2)$$

Extremely sharp Breit-Wigner  
invariant mass distribution

We can perform the integration over four variables

$$\int dM^2 d\theta_R d\phi_R d\phi_S (d^7\sigma^\uparrow + d^7\sigma^\downarrow) \propto 2\pi \left(1 - y + \frac{y^2}{2}\right) f_1(x) D_1(z)$$

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## Polarized $\Lambda$ production

$$d^7\sigma^\uparrow - d^7\sigma^\downarrow \propto (1 - y) \cos(\phi_h + \phi_R)$$

$$h_1(x) H_1(z) \alpha \sin \theta_R \mathcal{B}W(M^2; M_\Lambda^2)$$

Transversity

$\Lambda$  transversity fragmentation  
function

We can perform the integration over four variables

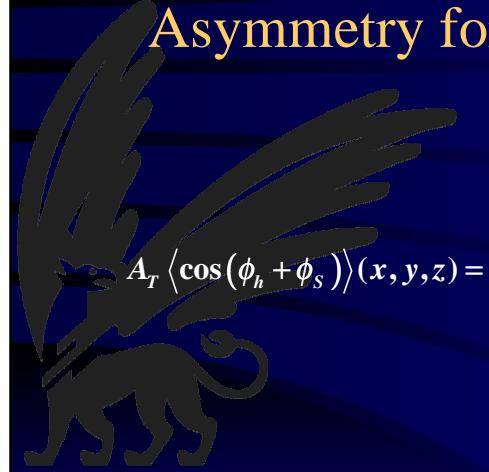
$$\int dM^2 d\theta_R d\phi_R d\phi_S \cos(\phi_R + \phi_S) (d^7\sigma^\uparrow - d^7\sigma^\downarrow) \propto \alpha (1 - y) h_1(x) H_1(z)$$

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# Asymmetry for $\Lambda$ production

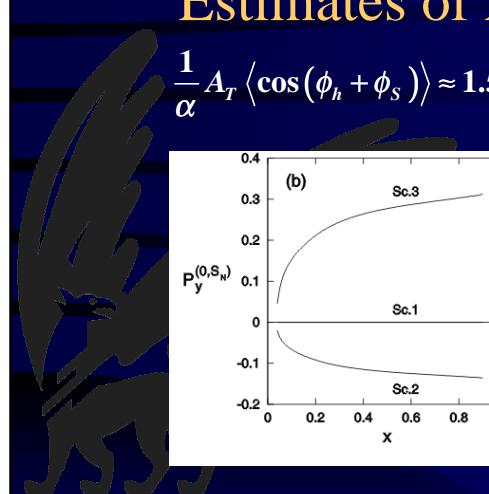


$$A_T \langle \cos(\phi_h + \phi_s) \rangle(x, y, z) = \frac{(1-y)}{\left(1 - y + \frac{y^2}{2}\right)} \frac{h_1(x)\alpha H_1(z)}{f_1(x)D_1(z)}$$

$\alpha = 0.642$

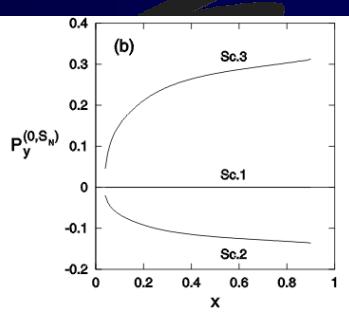
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## Estimates of $\Lambda$ asymmetry



$$\frac{1}{\alpha} A_T \langle \cos(\phi_h + \phi_s) \rangle \approx 1.5 A_T \langle \cos(\phi_h + \phi_s) \rangle$$

(b)



All light quarks contribute equally to the  $\Lambda$  spin

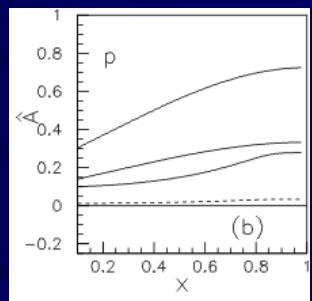
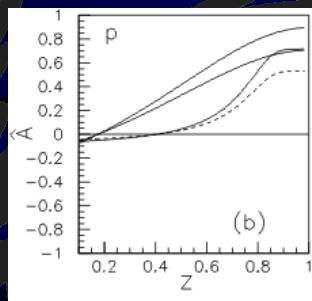
The whole  $\Lambda$  spin is carried by the s quark

*M. Anselmino, M. Boglione, F. Murgia, PLB 481 (2000)*

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## Estimates of $\Lambda$ asymmetry

$$\approx 1.5 A_T \langle \cos(\phi_h + \phi_s) \rangle$$



B.-Q. Ma, I. Schmidt, J.-J. Tang, PRD 64 (2001)

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## $\Lambda$ production summary

- The  $\Lambda$  can easily be distinguished from the continuous background.
- The transversity fragmentation function is probably sizable, but is difficult to give a reliable estimate for the asymmetries.
- The evolution of the function is known.

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## Two-pion fragmentation

$$d^7\sigma^\uparrow + d^7\sigma^\downarrow \propto \left(1 - y + \frac{y^2}{2}\right) f_1(x) D_1(z, \theta_R, \phi_R, M^2)$$

We can perform the integration over three variables

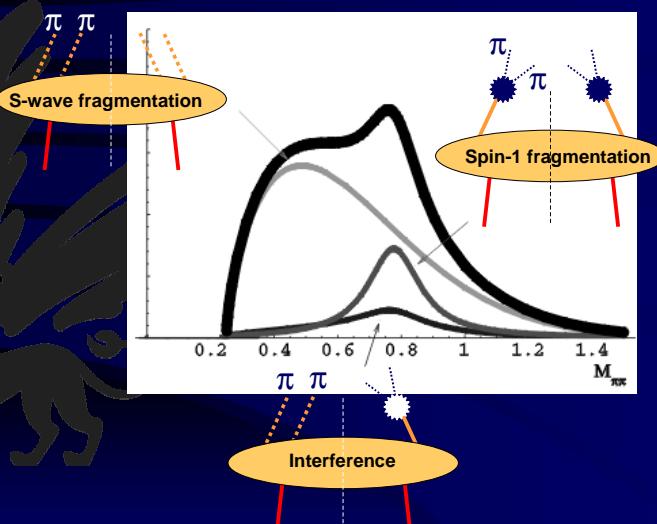
$$\int d\theta_R d\phi_R d\phi_S (d^7\sigma^\uparrow + d^7\sigma^\downarrow) \propto 2\pi \left(1 - y + \frac{y^2}{2}\right) f_1(x) D_1(z, M^2)$$

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## Invariant mass spectrum



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