# Strong and Electromagnetic Interactions at SPS Energies

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- Introduction: the Data
- Particle Ratios
- Implications
- Summary

# The Data: NA49, sqrt(s<sub>NN</sub>)=17 GeV



 $f = E \frac{d^3 \sigma}{dp^3}$ 

p+p

### **Particle Ratios**

#### $\pi^+/\pi^-$ ratios



+ Pb+Pb

– N+N

- Pb+Pb is compared to superposition of nucleon+nucleon (N+N) collisions
- **Neutron** fragmentation is obtained from p+p data:

 $n \rightarrow \pi^+ = p \rightarrow \pi^$  $n \rightarrow \pi^- = p \rightarrow \pi^+$ 



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- Characteristic structure in  $\boldsymbol{x}_{_{\!\mathsf{F}}}$  and  $\boldsymbol{p}_{_{\!\mathsf{T}}}$
- $\pi^+/\pi^-$  reaches zero at  $x_F = 0.15 = m_{\pi}/m_p$



# **Implications**





## **Summary**

- New, high precision data on particle production allow a detailed scrutiny of the mechanism of the hadronic interaction, from the elementary to the heavy-ion reaction;
- The heavy-ion collision appears as a mixture of different processes, involving the participant zone as well as the spectator system(s);
- The interplay between the strong and electromagnetic interactions results in visible distortions in ratios of charged particles produced in the collision;
- These distortions may bring new information on the dynamics of the collision.

#### Thank you!

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#### **Extra slides**

