

HADRONIZATION (I)

(1) COALESCENCE MODEL: GREAT ISSUE
AT ISMD04 (SUMMARY BY OCHS).

QUESTION: IS THERE AN INTERMEDIATE
STAGE WITH CONSTITUENT QUARKS?

MAYBE. EVIDENCE: \bar{h}/h RATES (ALCOR)

CHARGE FLUCTUATIONS (AR)

MESON/BARYON FLOW (VOLOCHIN)

CRONIN EFFECT (SHAO)

IF COALESCENCE MODEL VALID \rightarrow STRONG
SUPPORT FOR DECONFINEMENT

REMARK: PREDICTIONS OF C.M. DEPEND ON P_{\perp}

$p_{\perp} \lesssim 1 \text{ GeV}$ ONLY RATES \rightarrow CHALLENGE

$1.5 \text{ GeV} \lesssim p_{\perp} \lesssim 5 \text{ GeV}$ MOMENTUM OK

$p_{\perp} \gtrsim 5 \text{ GeV}$ COALESCENCE HAS NO CHANCE
TO WORK

REMARK #2: CORRELATIONS BETWEEN
CONSTITUENT QUARKS?

HADRONIZATION (II)

(2) NEXT STEP: STATISTICAL MODEL

CONSTITUENT QUARKS → HADRONIC RESONANCES

EQUILIBRIUM

(1) KINETIC — OK

(2) CHEMICAL: YES IF LONG TIME

NO IF SHORT TIME (BLAST?)

TORRIERI: MEASUREMENT OF BOTH

RATES & FLUCTUATIONS

CAN DISTINGUISH THE TWO PATTERNS

(3) DIRECT ENTROPY MEASUREMENT?

SIMAK & SUMBERA

ZHIMING LI: FIRST MEASUREMENT

OF COINCIDENCE PROBABILITIES

(NA22) REPORTED.

HBT CORRELATIONS

NEW TOOLS: HARMONIC DECOMPOSITION OF ANGULAR DISTRIBUTION (LISTA)

MC IMPLEMENTATION (UTYUZH)

NEW DATA: Cu-Cu FROM STAR (PANITKIN)

K⁰K⁰ FROM ZEUS (ZAWIEJSKI)

BLAST WAVE FIT: $R = 13 \text{ fm}$, $\tau = 10 \text{ fm}$, $v = 0.7c$
SURFACE GROWS 7 fm IN $10 \text{ fm}/c$! (PRATT)

CRAMER: PIONS SHOULD STRUGGLE BEFORE THEY CAN ESCAPE FROM THE MEDIUM: (A) ABSORPTION (B) CHIRAL PHASE TRANSITION \Rightarrow CALCULATE THE EFFECT USING ATTRACTIVE OPTICAL POTENTIAL MOTIVATED BY CHIRAL SYMMETRY. STRONG CORRECTIONS FOUND. GOOD FIT OBTAINED.

$R = 12 \text{ fm}$ $\tau_0 = 8.1 \text{ fm}$ $\Delta R = 4.6 \text{ fm}$

$\Delta \tau = 2.7 \text{ fm}$

TOOL TO STUDY CHIRAL TRANSITION ?

PRATT: SIMILAR EFFECT FROM CLASSICAL CALCULATION

LISTA: HEAVY ION DATA SCALE WITH pp DATA.

ALSO e^+e^- DATA

EXPANSION IN pp & e^+e^- ? GUSTAFSON

DWBA

PARTICLE DISTRIBUTIONS

ROLAND
NOUCIER

PHOBOS

(1) LIMITING FRAGMENTATION

(2) FACTORIZATION OF ENERGY & CENTRALITY DEPENDEN

$$(3) \frac{dN/dy}{N_W} \Big|_{Au} = \frac{dN/dy}{N_W} \Big|_{Cu} > \frac{dN/dy}{2} \Big|_{pp}$$

(4) NOUCIER: CONSTITUENT QUARK MODEL

$$\frac{dN/dy}{N_{Wq}} \Big|_{Au} = \frac{dN/dy}{N_{Wq}} \Big|_{Cu} = \frac{dN/dy}{N_{Wq}} \Big|_{pp}$$

SARKISYAN: SIMILAR + LANDAU MODEL

(5) WOUNDED QUARK MODEL:

W. CZYZ, W. FURMAŃSKI & AB, ACTA PHYS. POL. B8(77) 585.

De MARZO et al. Phys. Rev. D26 (82) 1019.

CONCLUSION: BULK MATTER SEEMS TO REMEMBER INITIAL CONDITIONS ...

GENERAL CORRELATION STUDIES

(a) NON-IDENTICAL PARTICLES (LEDNICKI):
CORRELATIONS GIVE INFORMATION ON
EMISSION PROFILES (IN SPACE & TIME)
LARGE PROGRAM AT STAR STARTED (LISA)

(b) BALANCE FUNCTIONS (BASS, DANIELEWICZ & PRATT)

LISA (STAR)
CHRISTAKOGLU (NA49)
NALI (NA22) } B.F. MUCH NARROWER THAN IN PP
& IN MODELS \rightarrow LATE CREATION
OF CHARGES.

IN COALESCENCE MODEL: BALANCE FUNCTION
MEASURES q & \bar{q} CORRELATIONS.

IN STATISTICAL MODEL: $B(pp) \approx 0$!

(c) F-B CORRELATIONS (ROLAND-PROBOS)
 \Rightarrow PARTICLES ARE PRODUCED IN CLUSTERS
OF 2-2.5 CHARGED PARTICLES

(d) P_L CORRELATIONS IN NA22 DATA:

HUANG: RAPIDITY DEPENDENCE STUDIED.

FU: METHOD TO DISENTANGLE MULTIPLICITY FROM P_L .

(e) STAR SEES A WEALTH OF CORRELATIONS
BETWEEN THE JET REMNANTS AT LOW Q^2 (TRAINOR)

QCD STUDIES

DE WOLF: CORRELATIONS INSIDE JET AT SMALL p_{\perp}
& AT SMALL $|p| \rightarrow$ PARTON-HADRON
DUALITY DOES NOT WORK.

FIATKOWSKI: HIGH ORDER MULTIPLICITY MOMENTS
DO NOT TEST PERT. QCD.

FABRI: MULTIPLICITY OF HEAVY/LIGHT QUARK
JETS AGREES WITH PQCD.

JETS SEDLAK: AT SMALL Q^2 , ANGULAR DIST. OF JETS
IN TESTS "COLOUR DYNAMICS".

HERA JOENSSON: AT HIGH Q^2 COLOUR DIPOLE M. BEST

SUTTON: GLUON DISTRIBUTIONS FROM JETS: PRECISE

STRAUB: FACTORIZATION OK IN INCLUSIVE

YAN
LEONIAN } LEADING NEUTRONS: NOT UNDERSTOOD
IN FORWARD DIRECTION

PETERS: BREAKING OF FACTORIZATION AT FNAL

KUPČO: THEORY REPORTED \rightarrow

NIKOLAEV: PARTON DISTRIBUTION IN NUCLEUS DERIVED
(IMPRESSIVE COLOUR FLOW CALCULATIONS)

BARTELS: AGK RULES IN PQCD STUDIED

GUSTAFSON: MULTIPLE COLLISIONS OF PARTONS.

HORRIBLE BUT THEY WILL DO IT
AT LUND (I AM CONVINCED).

SATURATION

Mc LERRAN

MARQUET : REPORT ON PHENOMENOLOGY

FORWARD JETS, DIFFRACTIVE VECTOR MESONS,
DIFFRACTIVE Ψ , DEEPLY VIRTUAL COMPTON,
DIFFRACTIVE JETS ...

FUJII : SATURATION & $q\bar{q}$ PRODUCTION

PESCHANSKI : TRAVELLING WAVE

COMPARED TO GEOMETRICAL SCALING DATA
USING FIRST PARTON DISTRIBUTIONS :
WAVE FRONT MEASURED !

TOKAREV : z -SCALING !

SLOWLY CRAWLING

ANTS

WILL EAT OUR

DREAMS

ANDRÉ BRETON

?