
40 ans de service

Jean Gosset

Café du SPhN
12 mars 2007

dapnia

cea

saclay

40 ans de service...

- presque tout à Saclay, à part
 - 2 ans à Berkeley (1975-1977)
 - 2 ans au CERN (1994-1996)
- pratiquement dans le même service
 - avec différents noms, suivant les restructurations
DPhN / ME → DPhN / SEPN → Dapnia / SPhN
 - plusieurs fois sur des projets multi-services
 - Diogène: les 4 services de physique du DPhN (au début)
 - Nomad: Dapnia / (SPP + SPhN)

1967-1975 cyclotron à énergie variable (Saclay)

- protons polarisés ~ 20 MeV
- réactions (p,d)
 - outil spectroscopique (J en plus de L)
 - thèse de Benjamin Mayer
- réactions (p,n) quasi-élastiques
 - **ma thèse**
 - « Contribution à l'étude des réactions (p,n) quasi-élastiques à l'aide d'un faisceau de protons polarisés »
 - 3 personnes pour faire les expériences
 - scintillateur liquide - discrimination gamma/neutrons par forme d'impulsion
 - fonctionnement du cyclotron hors résonance avec surveillance et alerte
 - partie du potentiel optique spin-orbite nucléon-noyau dépendant de l'isospin

1967-1975 cyclotron à énergie variable (Saclay)

PHYSICAL REVIEW C

VOLUME 14, NUMBER 3

SEPTEMBER 1976

Quasielastic (p, n) reactions induced by polarized protons

J. Gosset, B. Mayer, and J. L. Escudé

Service de Physique Nucleaire a Moyenne Energie, Centre d'Etudes Nucléaires de Saclay, BP. 2, 91190 Gif-sur-Yvette, France

(Received 12 November 1975)

The differential analyzing power has been measured in the quasielastic (p, n) reaction on ^{48}Ti , ^{56}Fe , ^{64}Ni , ^{70}Zn , ^{90}Zr , ^{96}Zr , ^{117}Sn , ^{165}Ho , and ^{208}Pb at 22.8 MeV. Fits to the experimental data in a macroscopic Lane-model analysis were improved by adding a spin-orbit term $V_{so}^{(1)}$ in the isospin-dependent part of the optical potential. The sign of $V_{so}^{(1)}$ agrees with that given by a simple model and its value does not depend very much on the target nucleus. However, the average value of $V_{so}^{(1)}$ depends on the geometry used for the spin-orbit optical potential, an ambiguity which corresponds to a nearly constant product of the depth and of the diffuseness. A microscopic distorted-wave Born-approximation analysis was made, but due to several ambiguities in the calculation, it has not been possible to determine the isovector spin-orbit part v_{LSr} of the nucleon-nucleon effective interaction.

[NUCLEAR REACTIONS Quasielastic ($\vec{p}, n$) reactions on ^{48}Ti , ^{56}Fe , ^{64}Ni , ^{70}Zn , ^{90}Zr , ^{96}Zr , ^{117}Sn , ^{165}Ho , and ^{208}Pb ; $E = 22.8$ MeV; measured differential analyzing power $A(\theta)$; macroscopic Lane-model analysis with an isospin-dependent spin-orbit term in the optical potential; microscopic DWBA analysis.]

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Après la thèse ?

1975-1977 Bevalac (LBL Berkeley)

- collisions noyau-noyau à haute énergie
- équation d'état de la matière nucléaire dense et chaude
- seconde génération d'expériences
 - semi-inclusives
 - télescopes + détecteur de multiplicité associée

1975-1977 Bevalac (LBL Berkeley)



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40 ans de service

Café du SPHN, 12 mars 2007

6 / 31

1975-1977 Bevalac (LBL Berkeley)

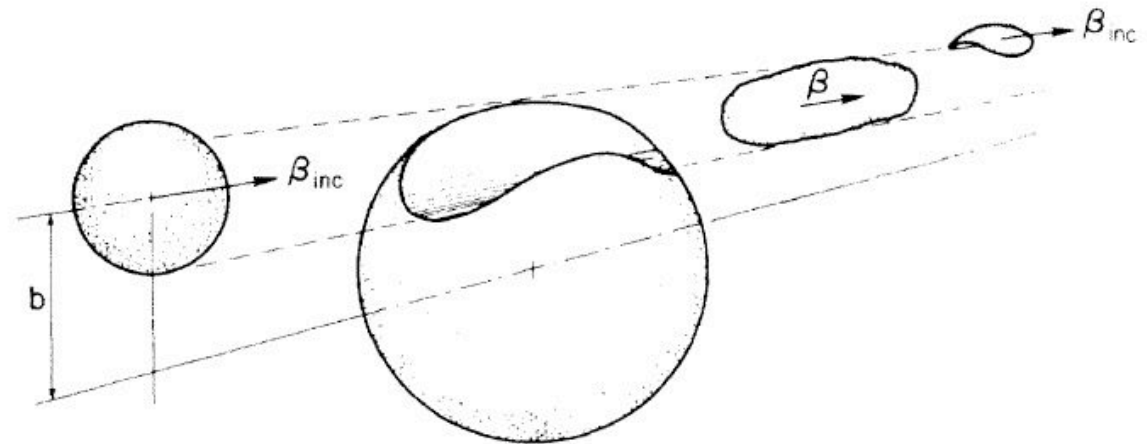


FIG. 1. A neon nucleus is incident on the uranium nucleus with a velocity β_{inc} in the laboratory frame and impact parameter b . The swept-out nucleons from the projectile and target are called the fireball, and their center of mass has the velocity β in the laboratory frame.

- modèle de la **boule de feu nucléaire**
 - idée simple: surface $\rightarrow$ volume
- modèle de **coalescence**

1975-1977 Bevalac (LBL Berkeley)

VOLUME 37, NUMBER 18

PHYSICAL REVIEW LETTERS

1 NOVEMBER 1976

Nuclear Fireball Model for Proton Inclusive Spectra from Relativistic Heavy-Ion Collisions*

G. D. Westfall, J. Gosset,[†] P. J. Johansen,[‡] A. M. Poskanzer, and W. G. Meyer
Lawrence Berkeley Laboratory, Berkeley, California 94720

and

H. H. Gutbrod
*Gesellschaft für Schwerionenforschung, Darmstadt, Germany, and Lawrence Berkeley Laboratory,
Berkeley, California 94720*

and

A. Sandoval
*Fachbereich Physik, Universität Marburg, Marburg, Germany, and Lawrence Berkeley Laboratory,
Berkeley, California 94720*

and

R. Stock
Fachbereich Physik, Universität Marburg, Marburg, Germany
(Received 30 August 1976)

A simple model is proposed for the emission of nucleons with velocities intermediate between those of the target and projectile. In this model, the nucleons which are mutually swept out from the target and projectile form a hot quasiequilibrated fireball which decays as an ideal gas. The overall features of the proton-inclusive spectra from 250- and 400-MeV/nucleon ^{20}Ne ions and 400-MeV/nucleon ^4He ions interacting with uranium are fitted without any adjustable parameters.

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393 citations (ISI Web of Knowledge)

1975-1977 Bevalac (LBL Berkeley)

PHYSICAL REVIEW C

VOLUME 16, NUMBER 2

AUGUST 1977

Central collisions of relativistic heavy ions*

J. Gosset,[†] H. H. Gutbrod, W. G. Meyer, A. M. Poskanzer, A. Sandoval, R. Stock, and G. D. Westfall

*Lawrence Berkeley Laboratory, Berkeley, California 94720,
Gesellschaft für Schwerionenforschung, Darmstadt, Germany,
and Fachbereich Physik, Universität Marburg, Marburg, Germany*

(Received 13 May 1977)

The energy spectra of protons and light nuclei produced by the interaction of ${}^4\text{He}$ and ${}^{20}\text{Ne}$ projectiles with Al and U targets have been investigated at incident energies ranging from 0.25 to 2.1 GeV per nucleon. Single fragment inclusive spectra have been obtained at angles between 25° and 150° , in the energy range from 30 to 150 MeV/nucleon. The multiplicity of intermediate and high energy charged particles was determined in coincidence with the measured fragments. In a separate study, fragment spectra were obtained in the evaporation energy range from ${}^{12}\text{C}$ and ${}^{20}\text{Ne}$ bombardment of uranium. We observe structureless, exponentially decaying spectra throughout the range of studied fragment masses. There is evidence for two major classes of fragments; one with emission at intermediate temperature from a system moving slowly in the lab frame, and the other with high temperature emission from a system propagating at a velocity intermediate between target and projectile. The high energy proton spectra are fairly well reproduced by a nuclear fireball model based on simple geometrical, kinematical, and statistical assumptions. Light cluster emission is also discussed in the framework of statistical models.

NUCLEAR REACTIONS $\text{U}({}^{20}\text{Ne}, X)$, $E = 250$ MeV/nucleon; $\text{U}({}^{20}\text{Ne}, X)$, $\text{U}(\alpha, X)$ $E = 400$ MeV/nucleon; $\text{U}({}^{20}\text{Ne}, X)$, $\text{Al}({}^{20}\text{Ne}, X)$, $E = 2.1$ GeV/nucleon; measured $\sigma(E, \theta)$, $X = p, d, t, {}^3\text{He}, {}^4\text{He}$. $\text{U}({}^{20}\text{Ne}, X)$, $\text{U}(\alpha, X)$, $E = 400$ MeV/nucleon; $\text{U}({}^{20}\text{Ne}, X)$, $E = 2.1$ GeV/nucleon; measured $\sigma(E, \theta)$, Li to O. $\text{U}({}^{20}\text{Ne}, X)$, $\text{U}({}^{12}\text{C}, X)$, $E = 2.1$ GeV/nucleon; measured $\sigma(E, 90^\circ)$, ${}^4\text{He}$ to B. Nuclear fireballs, coalescence, thermodynamics of light nuclei production.

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459 citations (ISI Web of Knowledge)

1977-1991 synchrotron Saturne (Saclay)

- Saturne 2
- sur 2 programmes de physique
- « simple »
 - **diffusion élastique nucléon-nucléon**
 - faisceau et cible polarisés
 - protons et neutrons
 - seulement au début (thèse de Fabienne Kunne)
- « complexe »
 - **collisions noyau-noyau**
 - détecteur 4π **Diogène**

1977-1991 Saturne... Diogène

- détecteur 4π

- choix: petite chambre à projection temporelle ou plutôt « jet chamber » pour concurrencer la « boule de plastique » au Bevalac
- beaucoup de temps pour le construire
- problèmes de fils
- un peu sous-dimensionné

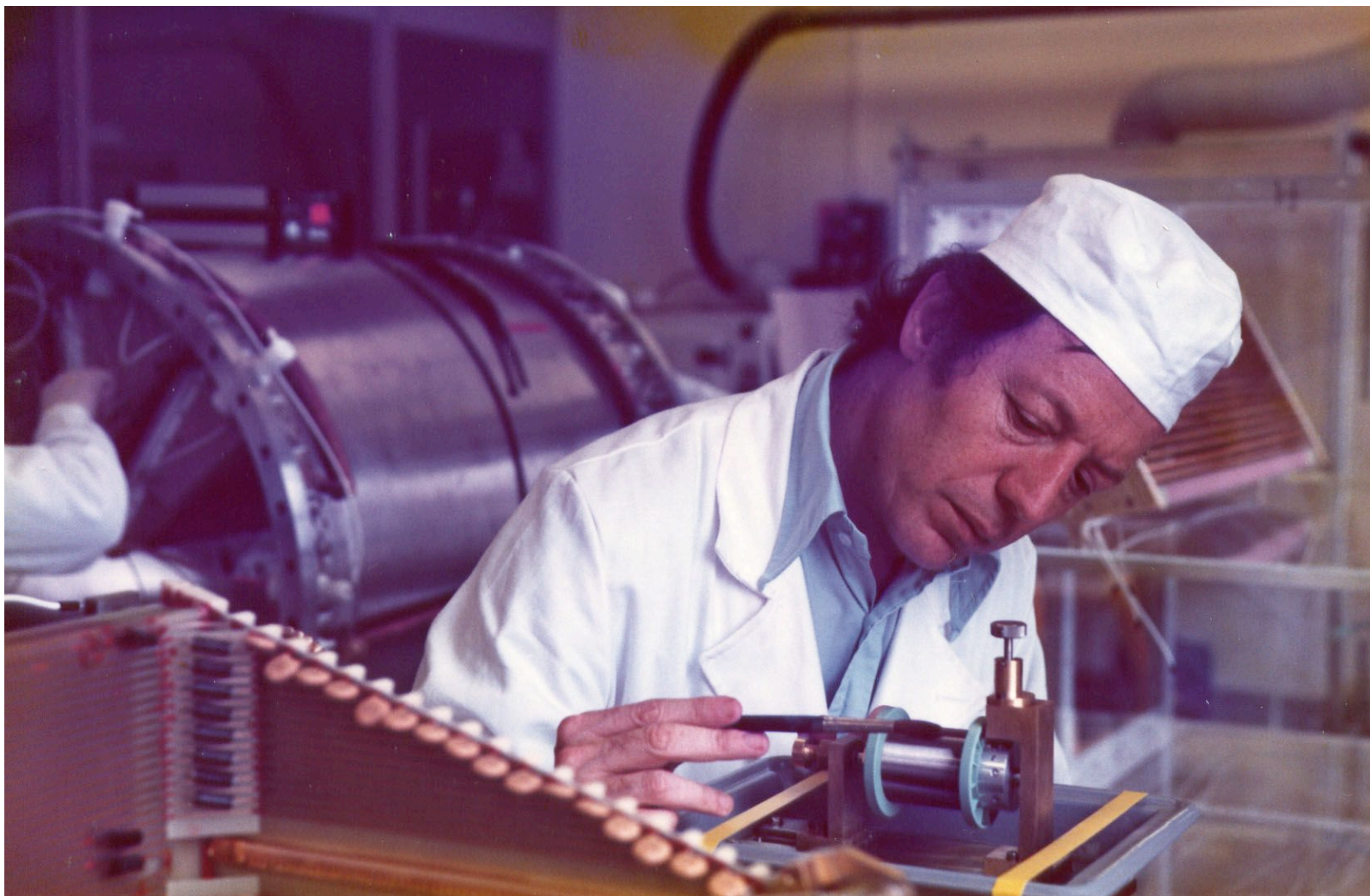
- beaucoup de temps pour avoir des faisceaux de noyaux lourds à Saturne

- Mimas = limace
- finalement néon et argon

- équipe ~30 personnes

- Saclay (tous les services du DPhN au début)
- Strasbourg
- Clermont-Ferrand

1977-1991 Saturne... Diogène



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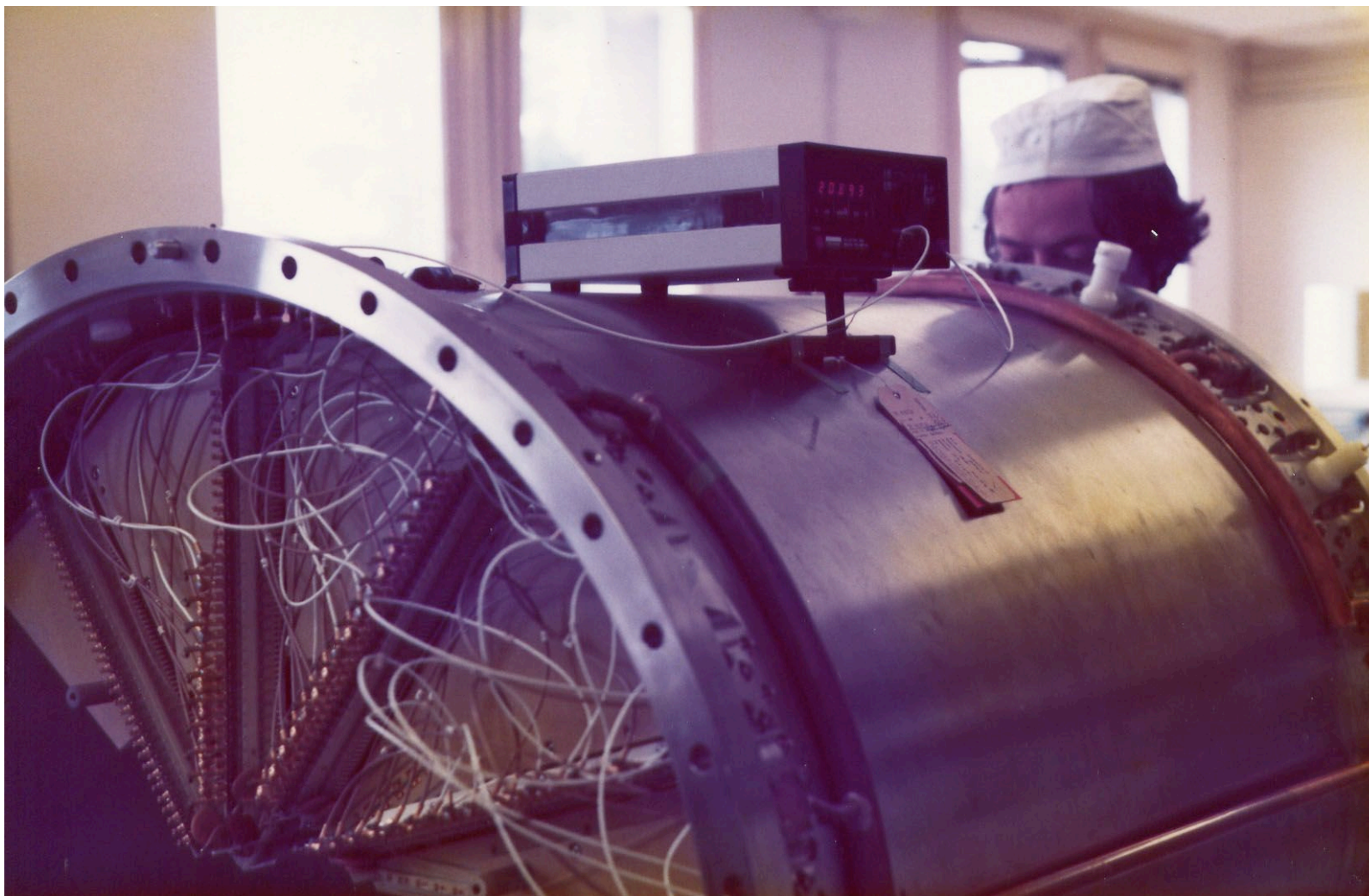
Jean Gosset

40 ans de service

Café du SPHN, 12 mars 2007

12 / 31

1977-1991 Saturne... Diogène



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13 / 31

1977-1991 Saturne... Diogène



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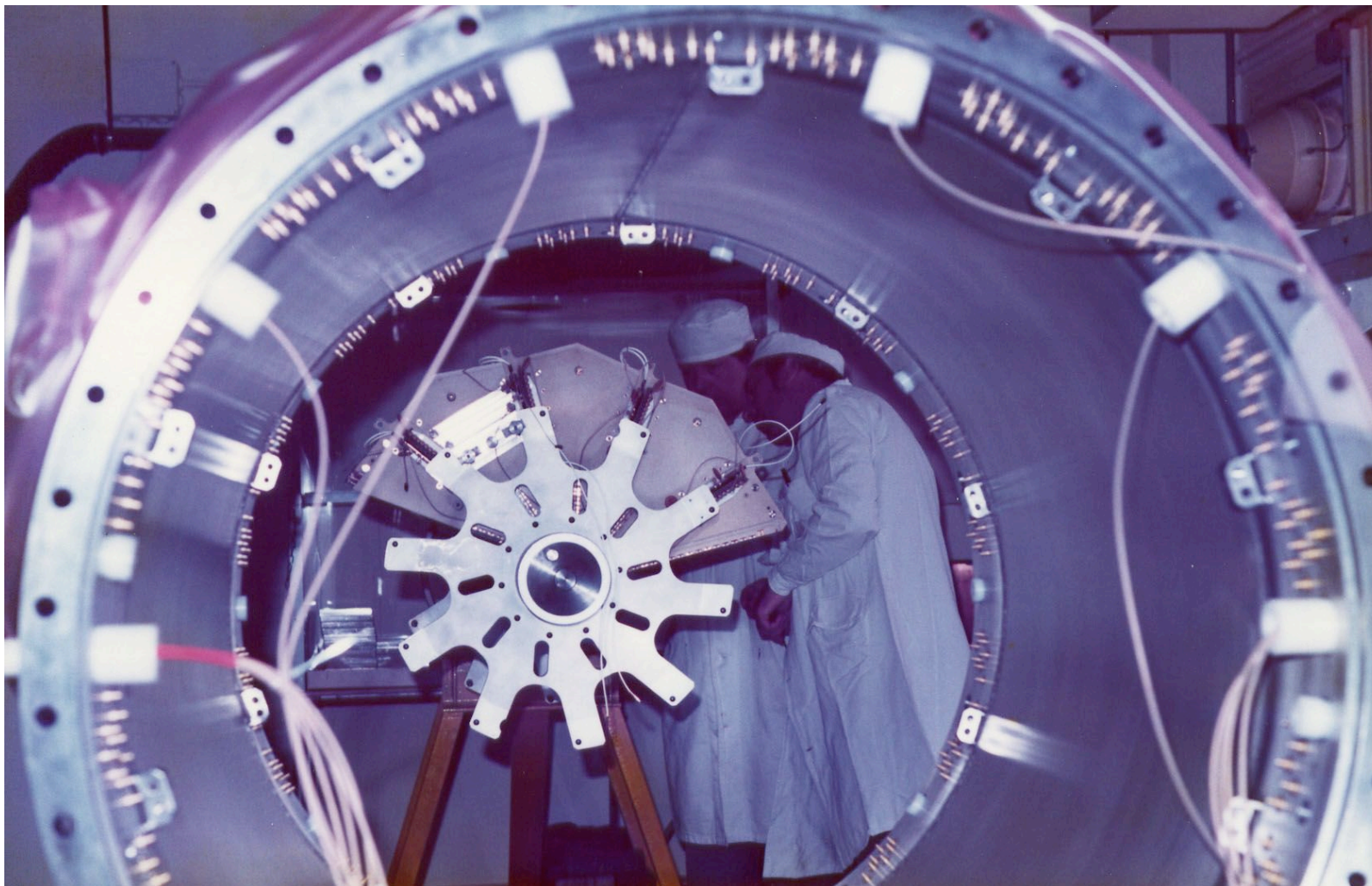
Jean Gosset

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14 / 31

1977-1991 Saturne... Diogène



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40 ans de service

Café du SPhN, 12 mars 2007

15 / 31

1977-1991 Saturne... Diogène



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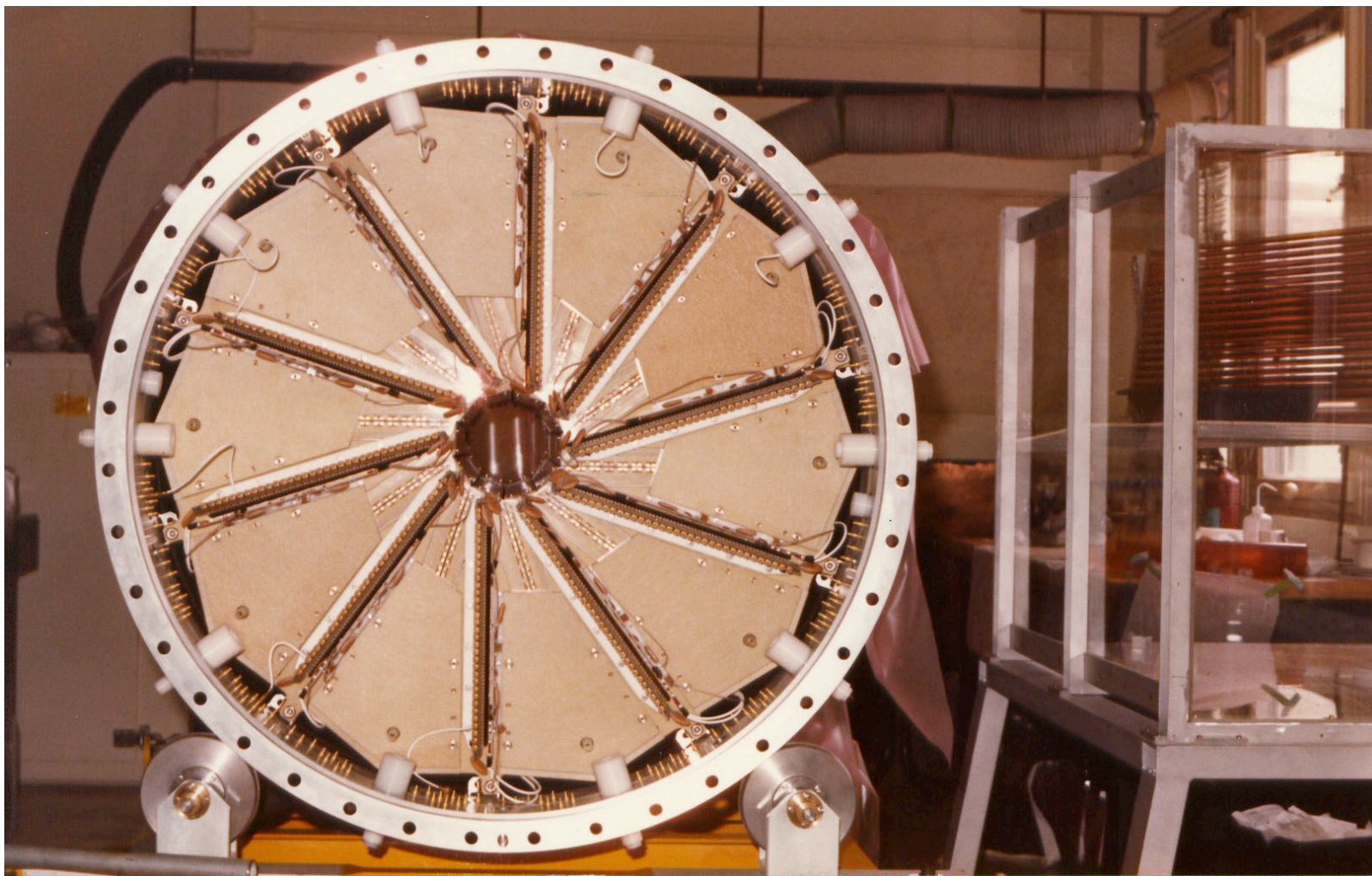
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Café du SPHN, 12 mars 2007

16 / 31

1977-1991 Saturne... Diogène



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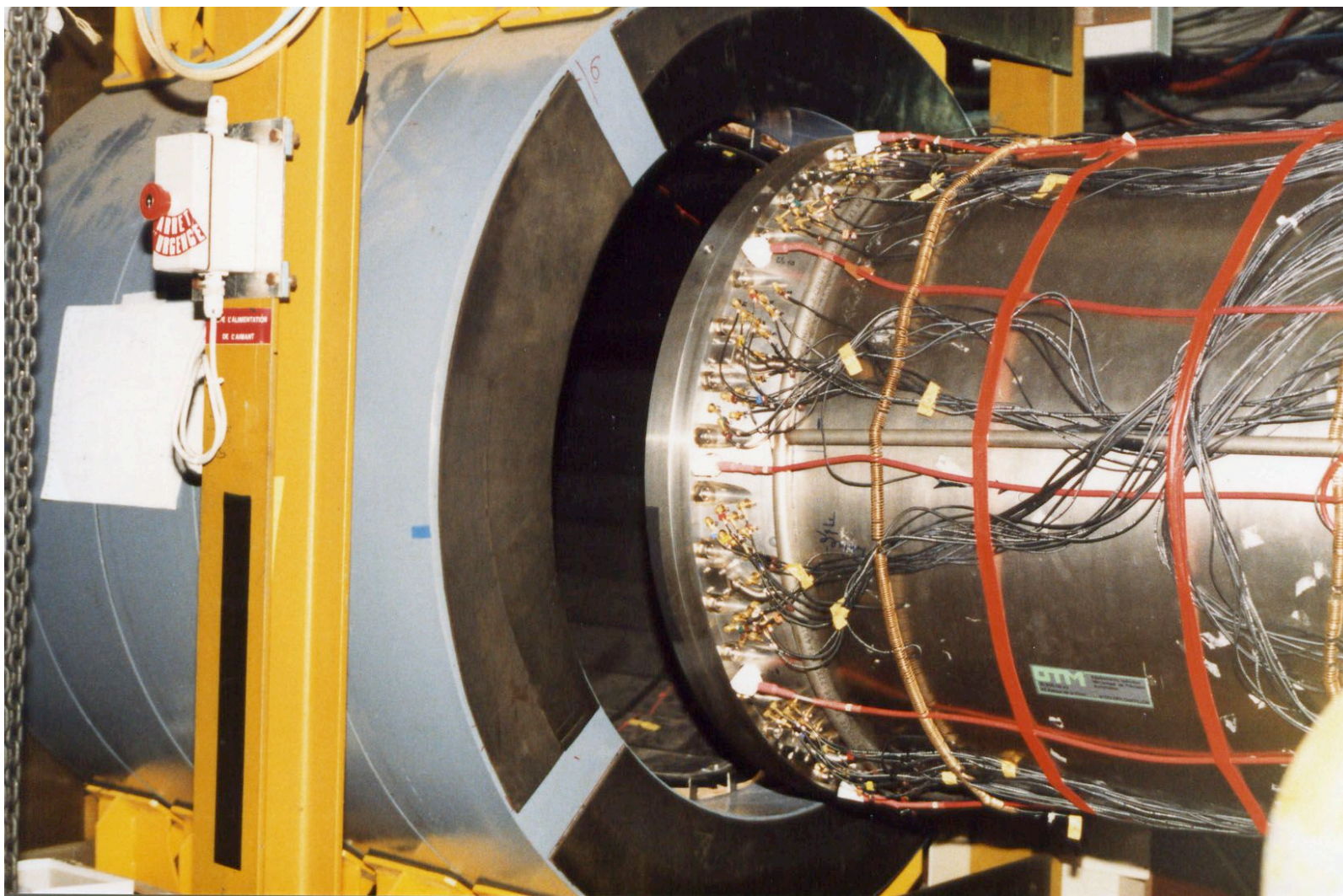
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17 / 31

1977-1991 Saturne... Diogène



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Café du SPhN, 12 mars 2007

18 / 31

1977-1991 Saturne... Diogène

- pions
- flot
 - v_1 - flot latéral (« bounce-off »)
 - analyse de Fourier de la distribution azimutale par rapport au plan de réaction
 - v_2 - effet presse-citron (« side-splash ») - maintenant flot elliptique
 - flot des pions
 - analyse complète à 3 dimensions - ellipsoïde - angle et rapports d'aspect
- ~ 20 thèses
 - Christian Cavata - Jacques Marroncle

1977-1991 Saturne... Diogène

PHYSICAL REVIEW C

VOLUME 42, NUMBER 4

OCTOBER 1990

Determination of the impact parameter in relativistic nucleus-nucleus collisions

C. Cavata, M. Demoulin, and J. Gosset

Département de Physique Nucléaire, Centre d'Etudes Nucléaires de Saclay, F 91191 Gif sur Yvette CEDEX, France

M.-C. Lemaire

*Département de Physique Nucléaire and Laboratoire National Saturne, Centre d'Etudes Nucléaires de Saclay,
F 91191 Gif sur Yvette CEDEX, France*

D. L'Hôte, J. Poitou, and O. Valette

Département de Physique Nucléaire, Centre d'Etudes Nucléaires de Saclay, F 91191 Gif sur Yvette CEDEX, France

(Received 2 March 1990)

A simple method is proposed for determining the impact parameter in relativistic nucleus-nucleus collisions. Assuming a monotonous correlation between multiplicity and impact parameter, the multiplicity dependence of the measured cross section is interpreted as an impact-parameter dependence of the geometrical reaction cross section. The reliability of this method is checked to be excellent within the framework of the intranuclear cascade model. Its application to data analysis at lower and higher energies is suggested.

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103 citations (ISI Web of Knowledge)

1977-1991 Saturne... Diogène

VOLUME 62, NUMBER 11

PHYSICAL REVIEW LETTERS

13 MARCH 1989

Nuclear Collective Flow and Charged-Pion Emission in Ne-Nucleus Collisions at $E/A = 800$ MeV

J. Gosset,⁽¹⁾ O. Valette,⁽¹⁾ J. P. Alard,⁽²⁾ J. Augerat,⁽²⁾ R. Babinet,⁽¹⁾ N. Bastid,⁽²⁾ F. Brochard,⁽³⁾
N. De Marco,^{(1),(a)} P. Dupieux,⁽²⁾ Z. Fodor,^{(1),(b)} L. Fraysse,⁽²⁾ P. Gorodetzky,⁽³⁾ M. C. Lemaire,⁽¹⁾
D. L'Hôte,⁽¹⁾ B. Lucas,⁽¹⁾ J. Marroncle,⁽²⁾ G. Montarou,⁽²⁾ M. J. Parizet,⁽²⁾ J. Poitou,⁽¹⁾ C. Racca,⁽³⁾
A. Rahmani,⁽²⁾ W. Schimmerling,^{(1),(c)} and Y. Terrien⁽¹⁾

⁽¹⁾*Département de Physique Nucléaire, Centre d'Etudes Nucléaires de
Saclay, F91191 Gif-sur-Yvette CEDEX, France*

⁽²⁾*Laboratoire de Physique Corpusculaire, Université de Clermont-Ferrand, BP 45, F63170 Aubière, France*

⁽³⁾*Centre de Recherches Nucléaires, BP 20 CR, F67037 Strasbourg CEDEX, France*

(Received 28 November 1988)

Triple-differential cross sections of charged pions were measured for collisions of Ne projectiles at $E/A = 800$ MeV with NaF, Nb, and Pb targets. The reaction plane was estimated event by event from the light-baryon momentum distribution. For heavy targets, preferential emission of charged pions away from the interaction zone towards the projectile side was observed in the transverse direction. Such a preferential emission, which is not predicted by cascade calculations, may be attributed to a stronger pion absorption by the heavier spectator remnant.

dapnia

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Jean Gosset

40 ans de service

Café du SPnN, 12 mars 2007

21 / 31

57 citations (ISI Web of Knowledge)

1977-1991 Saturne... Diogène

Physics Letters B

Volume 241, Issue 4, 24 May 1990, Pages 476-480

doi:10.1016/0370-2693(90)91855-6  Cite or Link Using DOI
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Measurement of a Baryon azimuthal emission pattern in Ne+(NaF, Nb, Pb) collisions at 800 MeV per nucleon

M. Demoulin^a, D. L'Hôte^a, J. P. Alard^b, J. Augerat^b, R. Babinet^a, N. Bastid^b, F. Brochard^c, C. Cavata^a, N. De Marco^{a,1}, P. Dupieux^b, H. Fanet^a, Z. Fodor^{a,2}, L. Fraysse^b, P. Gorodetzky^c, J. Gosset^a, T. Hayashino^{a,3}, M. C. Lemaire^d, A. Le Merby^a, B. Lucas^a, J. Marroncle^b, G. Montarou^b, M. J. Parizet^b, J. Poitou^a, C. Racca^c, W. Schimmerling^{a,4}, Y. Terrien^a and O. Valette^a

^a DPhN, CEN Saclay, F-91191, Gif-sur-Yvette Cedex, France

^b LPC Clermont-Ferrand, B.P. 45, F-63170, Aubière, France

^c CRN, B.P. 20 CR, F-67037, Strasbourg Cedex, France

^d LNS, CEN Saclay, F-91191, Gif-sur-Yvette Cedex, France

Received 19 December 1989. Available online 18 October 2002.

Abstract

Triple-differential cross sections of proton-like particles were obtained for Ne+NaF, Ne+Nb and Ne+Pb reactions at 800 MeV per nucleon from quasi-exclusive measurements. Their dependence upon the azimuthal angle with respect to the reaction plane is analyzed. In addition to the usual flow pattern, another component of the azimuthal dependence is observed. It can be parametrized using the second order parameters in Fourier series expansion. The dependence of this component upon transverse momentum, rapidity and impact parameter (multiplicity) is investigated.

56 citations (ISI Web of Knowledge)

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1977-1991 Saturne... Diogène



1977-1991 Saturne... Diogène



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40 ans de service

Café du SPhN, 12 mars 2007

24 / 31

1977-1991 synchrotron Saturne (Saclay)

- après Diogène ?

- choix de ne pas rejoindre NA38 au CERN
- dispersion des physiciens
physique des particules, physique du solide, climatologie...
- Diogène a servi à autre chose
 - $pp \rightarrow pp\pi^0$
 - excitation de la résonance Δ dans les noyaux
par réaction ($^3\text{He}, t$)
- et a inspiré FOPI à GSI

- Arcole

- $pp \rightarrow pK^+\Lambda$
- données de base avant fermeture prévue de Saturne
- chambres à fils cylindriques + chambres à fils à l'avant
- une redondance cinématique
- feu orange mais pas rouge, pas mal de temps perdu
- [donc pas la dernière expérience à Saturne]

1990-1991 adjoint du chef du SEPN

- sans l'être vraiment
- période difficile de restructuration
- gazette du SEPN
 - n°1 janvier 1990 seul
 - les nouvelles du DPhN (Babinet puis Fernandez): partie concernant le SEPN
 - jusqu'au 7 mars 1991
 - ancêtre (modeste) de Scintillations
- démission fin mars 1991

1992-1998 Nomad (CERN)

- oscillations de neutrinos ($\nu_\mu \rightarrow \nu_\tau$)
- pourquoi ce choix ?
 - physique « simple »
 - 1 quantité à mesurer
 - appareillage et analyse complexes
 - par opposition aux collisions noyau-noyau
 - but « simple »
équation d'état de la matière nucléaire dense et chaude
 - nombreuses observables plus ou moins robustes
- équipe ~ 100 physiciens
- équipe transverse dans le Dapnia
 - essentiellement SPP: 6 physiciens
 - SPhN: 2 physiciens (Alberto Baldisseri, JG)
et un thésard (Patrick Rathouit)
- 2 ans au CERN (1994-1996)
- pas de signal d'apparition du neutrino-tau
- amélioration de la limite supérieure

1998-2007 Plasma de quarks et de gluons (PQG)

- NA50 (CERN) - ALICE (CERN) - PHENIX (BNL)
- pourquoi ce choix ?
 - une équipe de jeunes très motivés
 - des résultats de NA50 très intéressants:
suppression anormale du J/Ψ dans les collisions Pb+Pb
- NA50
 - brève participation
 - mauvais souvenir
- ALICE
 - tests pour utilisation de Micromégas:
 - non concluants
 - choix de chambres à fils à cathodes segmentées
 - simulations - reconstruction de trace

1998-2007 PQG... PHENIX

- expérience en cours au BNL
- ~ 400 physiciens
- très bonne ambiance
 - règles claires, porte-parole qui remplit très bien sa tâche
- très important pour le groupe en attendant le LHC
- physique: production du J/Ψ
- financement d'une partie de l'électronique des spectromètres à muons, installation de cette électronique
- participation aux prises de données
- thèse de Yann Cobigo (2004)
- reconstruction de traces
 - filtre de Kalman, finalisé par Hugo Pereira dans le nouveau cadre informatique (OO)
- publications: comité de revue interne, beaucoup de relectures

1998-2007 PQG... PHENIX

- le J/Ψ

- peut-être pas le résultat le plus intéressant
- grâce à lui, PHENIX mérite son nom
 - le J/Ψ , tel un phénix, renaît de ses cendres
 - recombinaison ?
- important d'avoir des mesures à différentes rapidités

- autres sondes

- « jet quenching » avec de plus en plus en détails
- loi d'échelle pour le flot elliptique: partonique
- en faveur du sQGP
« strongly coupled quark gluon plasma »

- bonne chance à ALICE

- [site bibliographique sur le PQG]
 - <http://www-dapnia.cea.fr/qgp/>
 - développé avec François Gelis
- [Dictionnaire des sciences et techniques nucléaires]
- Société française de physique (SFP): adhérez
 - PIF10: Physique et Interrogations Fondamentales
« Surprenante plasticité, structures et évolutions »
Bibliothèque Nationale de France et Internet
 - congrès à Grenoble du 9 au 13 juillet 2007
- des hauts et des bas
 - heureusement beaucoup plus de hauts que de bas
- changement d'activité en cours de carrière
 - prendre du temps pour bien choisir
 - si on vient vous chercher, ce n'est jamais le bon moment, mais...

Supplément

dapnia

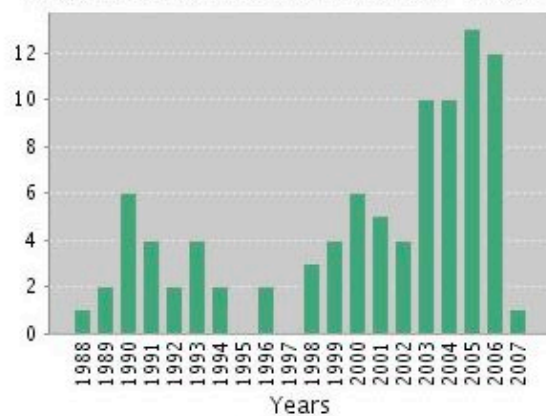


saclay

• [membre de comités...]

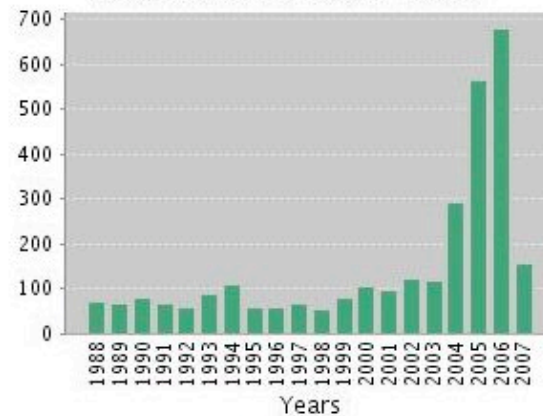
- comité des expériences de Saturne (secrétaire)
- conseil scientifique du GANIL
- comité d'organisation de la conférence
« Nucleus-Nucleus collisions » à Saint-Malo en 1988
- conseil scientifique et technique du SPhN
- conseil scientifique de l'école Joliot-Curie
- bureau éditorial de Journal of Physics G

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Phys. Rev. C 14, 878 - 895 (1976)

[Issue 3 – September 1976]

Quasielastic (p, n) reactions induced by polarized protons

J. Gosset, B. Mayer, and J. L. Escudé

Service de Physique Nucléaire à Moyenne Energie, Centre d'Etudes Nucléaires de Saclay, BP. 2, 91190 Gif-sur-Yvette, France

Received 12 November 1975

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NUCLEAR REACTIONS Quasielastic ($p \rightarrow n$) reactions on ^{49}Ti , ^{56}Fe , ^{64}Ni , ^{70}Zn , ^{90}Zr , ^{96}Zr , ^{117}Sn , ^{165}Ho , and ^{208}Pb ; $E=22.8$ MeV; measured differential analyzing power $A(\theta)$ macroscopic Lane-model analysis with an isospin-dependent spin-orbit term in the optical potential; microscopic DWBA analysis.

Phys. Rev. C 16, 629 - 657 (1977)

[Issue 2 – August 1977]

Nuclear Fireball Model for Proton Inclusive Spectra from Relativistic Heavy-Ion Collisions

G. D. Westfall, J. Gosset*, P. J. Johansen[§], A. M. Poskanzer, and W. G. Meyer
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R. Stock
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Received 30 August 1976

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dapnia

cea

saclay

Phys. Rev. C 16, 629 - 657 (1977)

[Issue 2 – August 1977]

Central collisions of relativistic heavy ions

J. Gosset*, H. H. Gutbrod, W. G. Meyer, A. M. Poskanzer, A. Sandoval, R. Stock, and G. D. Westfall
Lawrence Berkeley Laboratory, Berkeley, California 94720,
Gesellschaft für Schwerionenforschung, Darmstadt, Germany,
Fachbereich Physik, Universität Marburg, Marburg, Germany

Received 13 May 1977

The energy spectra of protons and light nuclei produced by the interaction of ^4He and ^{20}Ne projectiles with Al and U targets have been investigated at incident energies ranging from 0.25 to 2.1 GeV per nucleon. Single fragment inclusive spectra have been obtained at angles between 25° and 150° , in the energy range from 30 to 150 MeV/nucleon. The multiplicity of intermediate and high energy charged particles was determined in coincidence with the measured fragments. In a separate study, fragment spectra were obtained in the evaporation energy range from ^{12}C and ^{20}Ne bombardment of uranium. We observe structureless, exponentially decaying spectra throughout the range of studied fragment masses. There is evidence for two major classes of fragments; one with emission at intermediate temperature from a system moving slowly in the lab frame, and the other with high temperature emission from a system propagating at a velocity intermediate between target and projectile. The high energy proton spectra are fairly well reproduced by a nuclear fireball model based on simple geometrical, kinematical, and statistical assumptions. Light cluster emission is also discussed in the framework of statistical models.

NUCLEAR REACTIONS $\text{U}(^{20}\text{Ne}, X)$, $E=250$ MeV/nucleon.; $\text{U}(^{20}\text{Ne}, X)$, $\text{U}(\alpha, X)$ $E=400$ MeV/nucleon.; $\text{U}(^{20}\text{Ne}, X)$, $\text{Al}(^{20}\text{Ne}, X)$, $E=2.1$ GeV/nucleon.; measured $\sigma(E, \theta)$, $X=p, d, t, ^3\text{He}, ^4\text{He}$. $\text{U}(^{20}\text{Ne}, X)$, $\text{U}(\alpha, X)$, $E=400$ MeV/nucleon.; $\text{U}(^{20}\text{Ne}, X)$, $E=2.1$ GeV/nucleon.; measured $\sigma(E, \theta)$, Li to O. $\text{U}(^{20}\text{Ne}, X)$, $\text{U}(^{12}\text{C}, X)$, $E=2.1$ GeV/nucleon.; measured $\sigma(E, 90^\circ)$, ^4He to B. Nuclear fireballs, coalescence, thermodynamics of light nuclei production.

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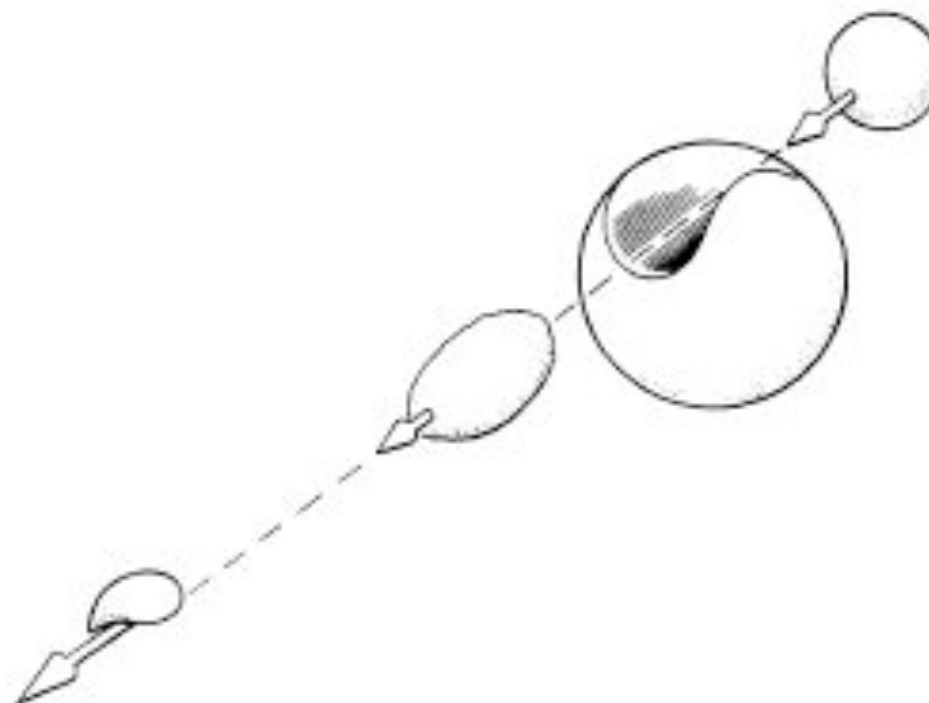


FIG. 23. In the fireball model the target and projectile are assumed to make clean cylindrical cuts through each other leaving a target spectator residue, and if the impact parameter is large enough also a projectile spectator. The fireball is made up from the participant nucleons which are mutually swept out in the primary interaction.

