C3F2

Collect, Classify & Compute Form Factors

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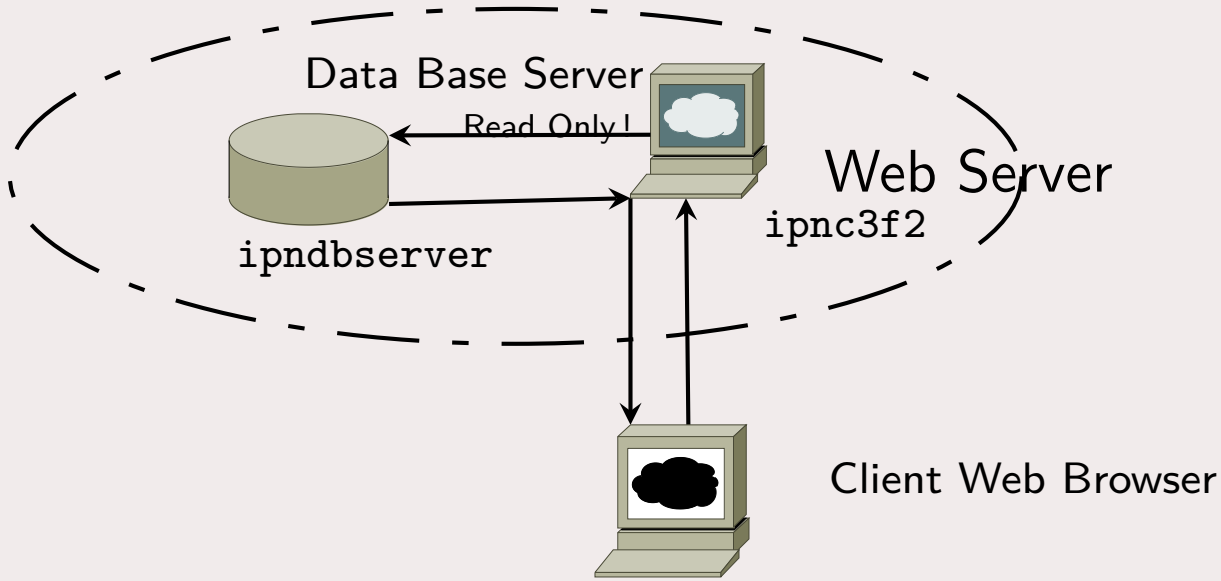
An Information System for Nucleon Form Factors

Collect, Classify & Compute Form Factors

1. Data concerning Nucleon Form Factors in different regions are scattered along a number of publications. . .
2. . . .we gathered them in a database
3. . . .and will soon open a web access to browse them
4. . . .to display them
5. . . .and eventually to fit them

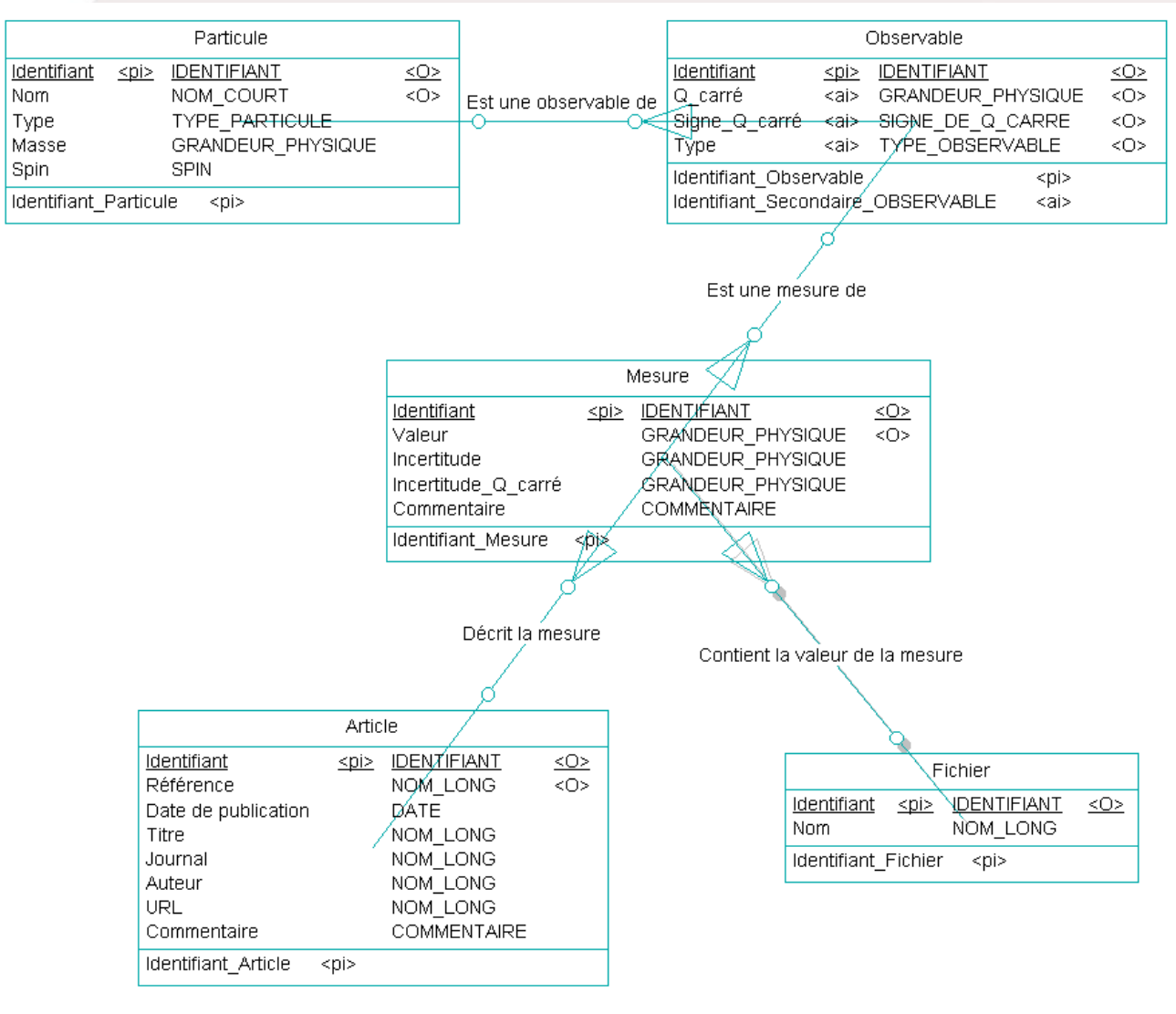
Map of the Information System



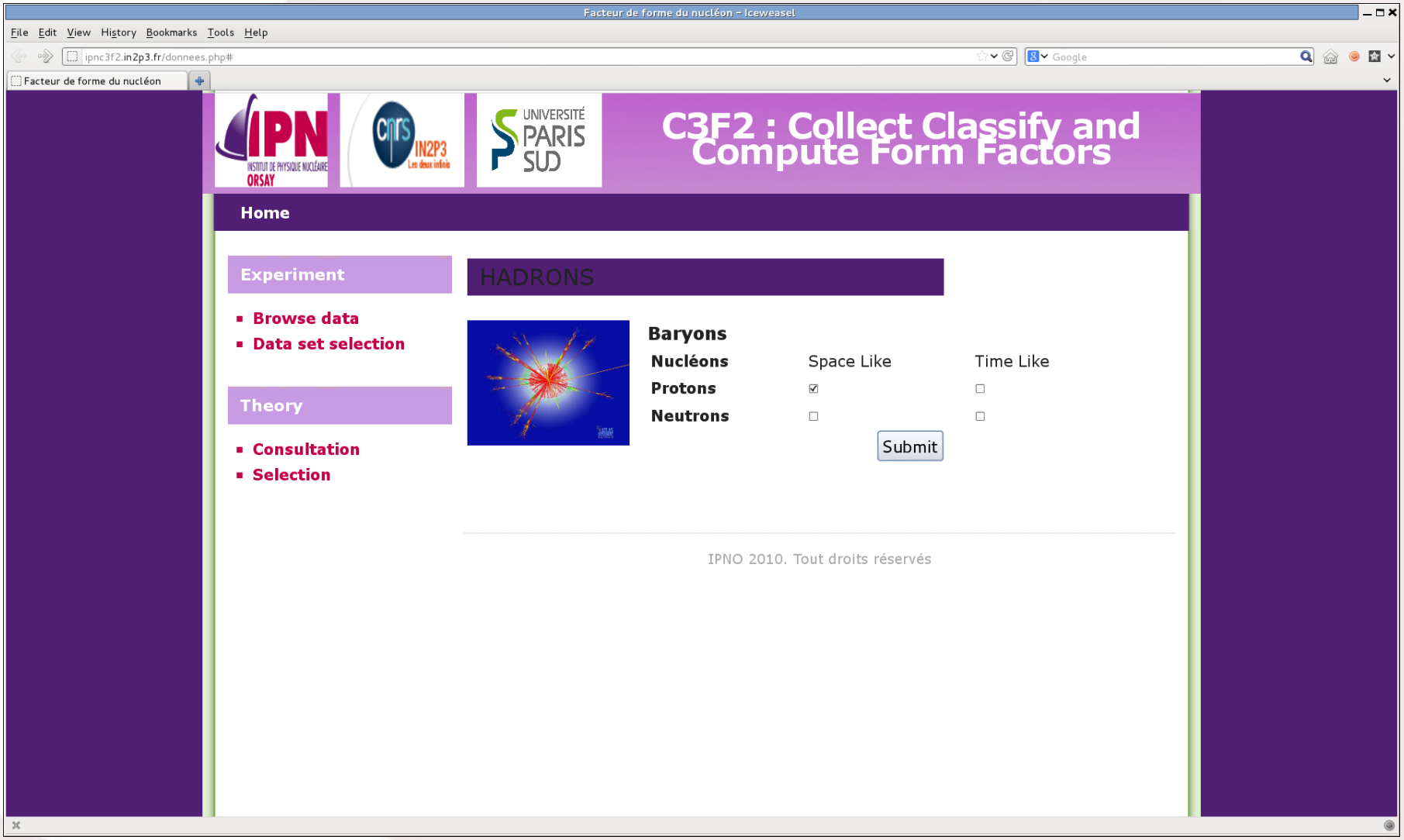
Technical Overview

- the data (article reference, form factor measurement...)
- ...where collected in text files
- ...have been integrated with an automated procedure
- ...are now kept in a database
  (`PostgreSQL` on `ipndbserver.in2p3.fr`)
- the site is run by an
  `Apache` Web server on `ipnc3f2.in2p3.fr`
- ...mixing `PHP`, `C++/CGI` & `Root` libraries
- site sources are kept under versionning system
  (`Subversion` on `ipnvcs.in2p3.fr`)
- developers, maintainers and registered users can issue tickets (bug report, wanted features) on `forge.in2p3.fr`

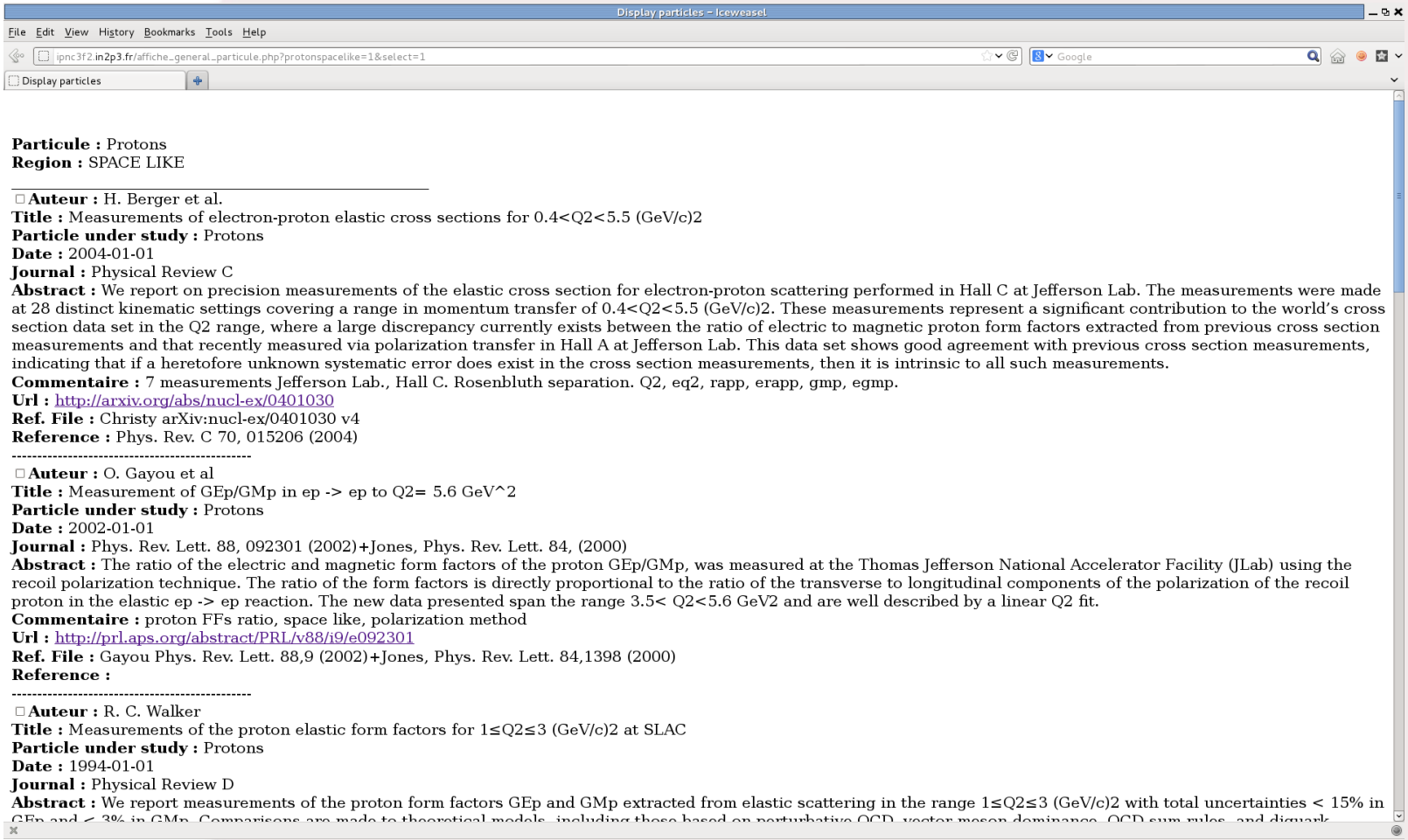
Entity–relationship model



Example results (1)



Example results (2)



Particule : Protons
Region : SPACE LIKE

□ **Auteur :** H. Berger et al.
Title : Measurements of electron-proton elastic cross sections for 0.4<Q2<5.5 (GeV/c)2
Particle under study : Protons
Date : 2004-01-01
Journal : Physical Review C
Abstract : We report on precision measurements of the elastic cross section for electron-proton scattering performed in Hall C at Jefferson Lab. The measurements were made at 28 distinct kinematic settings covering a range in momentum transfer of 0.4<Q2<5.5 (GeV/c)2. These measurements represent a significant contribution to the world's cross section data set in the Q2 range, where a large discrepancy currently exists between the ratio of electric to magnetic proton form factors extracted from previous cross section measurements and that recently measured via polarization transfer in Hall A at Jefferson Lab. This data set shows good agreement with previous cross section measurements, indicating that if a heretofore unknown systematic error does exist in the cross section measurements, then it is intrinsic to all such measurements.
Commentaire : 7 measurements Jefferson Lab., Hall C. Rosenbluth separation. Q2, eq2, rapp, erapp, gmp, egmp.
Url : http://arxiv.org/abs/nucl-ex/0401030
Ref. File : Christy arXiv:nucl-ex/0401030 v4
Reference : Phys. Rev. C 70, 015206 (2004)

□ **Auteur :** O. Gayou et al
Title : Measurement of GEp/GMp in ep -> ep to Q2= 5.6 GeV^2
Particle under study : Protons
Date : 2002-01-01
Journal : Phys. Rev. Lett. 88, 092301 (2002)+Jones, Phys. Rev. Lett. 84, (2000)
Abstract : The ratio of the electric and magnetic form factors of the proton GEp/GMp, was measured at the Thomas Jefferson National Accelerator Facility (JLab) using the recoil polarization technique. The ratio of the form factors is directly proportional to the ratio of the transverse to longitudinal components of the polarization of the recoil proton in the elastic ep -> ep reaction. The new data presented span the range 3.5< Q2<5.6 GeV2 and are well described by a linear Q2 fit.
Commentaire : proton FFs ratio, space like, polarization method
Url : http://prl.aps.org/abstract/PRL/v88/i9/e092301
Ref. File : Gayou Phys. Rev. Lett. 88,9 (2002)+Jones, Phys. Rev. Lett. 84,1398 (2000)
Reference :

□ **Auteur :** R. C. Walker
Title : Measurements of the proton elastic form factors for 1≤Q2≤3 (GeV/c)2 at SLAC
Particle under study : Protons
Date : 1994-01-01
Journal : Physical Review D
Abstract : We report measurements of the proton form factors GEp and GMp extracted from elastic scattering in the range 1≤Q2≤3 (GeV/c)2 with total uncertainties < 15% in GEp and < 3% in GMp. Comparisons are made to theoretical models, including those based on perturbative QCD, vector meson dominance, QCD sum rules, and diquark

Example results (3a)

CF3F2 – Iceweasel

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ipnc3f2.in2p3.fr/cgi-bin/c3f2.cgi?id=6&particule=Neutrons&region=SPACE LIKE

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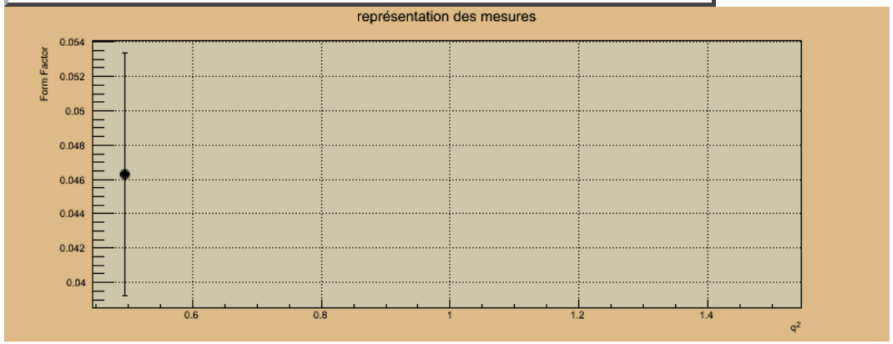
Retour à la liste des articles.

Title : Measurement of the Electric Form Factor of the Neutron through $\vec{d}(\vec{e},e'n)p$ at Q2 = 0.5(GeV/c

Author : H. Zhu
Particle under study : Neutrons
Date : 2001-01-01
Journal : Physics Review Letters
Abstract : We report the first measurement using a solid polarized target of...
Url : http://link.aps.org/doi/10.1103/PhysRevLett.87.081801
Commentary : 1 measurement, (USA), q2 <= 0,495 (GeV/c)2. Q2, eq2, gen, egen
Reference File : Zhu Phys. Rev. Lett. 87 (2001)
Ref : Phys. Rev. Lett. 87, 081801 (2001) [4 pages]

Particle under study : Neutrons
Observed Type : ELECTRIC

q^2 [$(Gev/c^2)^2$]	incertitude sur q^2[$\Delta(q^2)$]	Valeur	Incertitude sur la Valeur
0.495	0	0.0463	0.0071



Example results (3b)

CF3F2 – Iceweasel

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ipnc3f2.in2p3.fr/cgi-bin/c3f2.cgi?id=4,5&particule=Neutrons&region=SPACE LIKE

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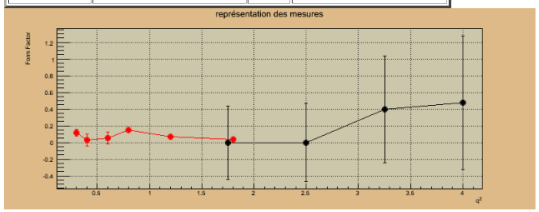
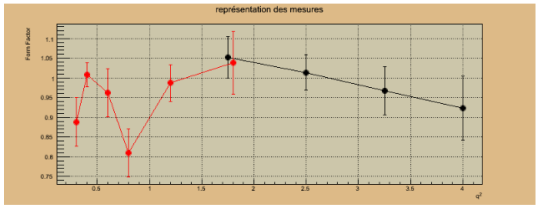
Author : A. Lung et al.
Particule under study : Neutrons
Date : 1993-01-01
Journal : Physical Review Letters
Abstract : Quasielastic e-d cross sections have been measured at forward and backward...
Url : http://link.aps.org/doi/10.1103/PhysRevLett.70.718
Commentary : 4 measurements, SLAC, 1.75 <= q2 <= 4 (GeV/c)2. Q2, eq2, gen, egen, gmn, egmn.
Reference File : Lung Phy Rev Lett 70,6,1993
Ref : Phys. Rev. Lett. 70 (1993) 718

Particule under study : Neutrons
Observed Type : ELECTRIC

q² [(Gev/c²)²]	incertitude sur q²[Δ(q²)]	Valeur	Incertitude sur la Valeur
4	0	0.48	0.8
3.25	0	0.4	0.64
2.5	0	0	0.47
1.8	0	0.041	0.03
1.75	0	0	0.44
1.2	0	0.072	0.02
0.8	0	0.146	0.016
0.6	0	0.053	0.069
0.4	0	0.032	0.072
0.3	0	0.115	0.04





Particule under study : Neutrons
Observed Type : MAGNETIC

q² [(Gev/c²)²]	incertitude sur q²[Δ(q²)]	Valeur	Incertitude sur la Valeur
4	0	0.923	0.081
3.25	0	0.967	0.061
2.5	0	1.014	0.045
1.8	0	1.039	0.08
1.75	0	1.052	0.052
1.2	0	0.987	0.047
0.8	0	0.809	0.061
0.6	0	0.963	0.061
0.4	0	1.008	0.03
0.3	0	0.888	0.062

Find: H. Berger et al. Previous Next Highlight all Match case Reached end of page, continued from top

Conclusion

C3F2 allows us to browse and vizualise Nucleon Form Factors both in Space-like and Time-Like region, for various Q^2

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Thanks for your attention

questions ?

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