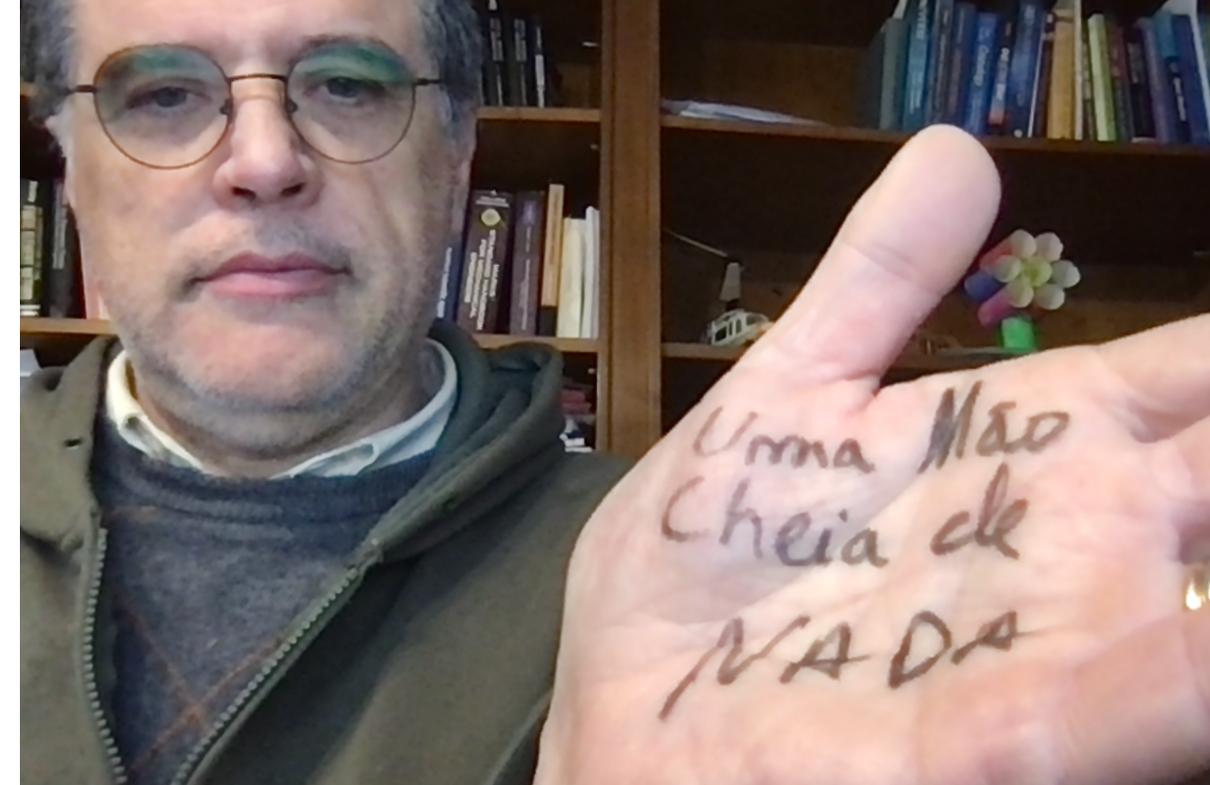


JDD e a Física de Partículas

Uma visão `distância ...

António Amorim, CENTRA e FCUL



- De onde conheço o Jorge Dias de Deus:

- meu Professor de Interações Fortes (modulo)
 - Mestrado em Física Nuclear e Partículas em 1987 (... 34 anos ...)
- investigador do IFM onde fiz o doutoramento.
- Colaborador do CERN onde nos encontrámos algumas vezes.

Jorge Dias de Deus (Lisbon, CENTRA) 

hep-ph

Author Identifier: [J.Dias.de.Deus.1](#)

202 publicações de 1970 a 2014

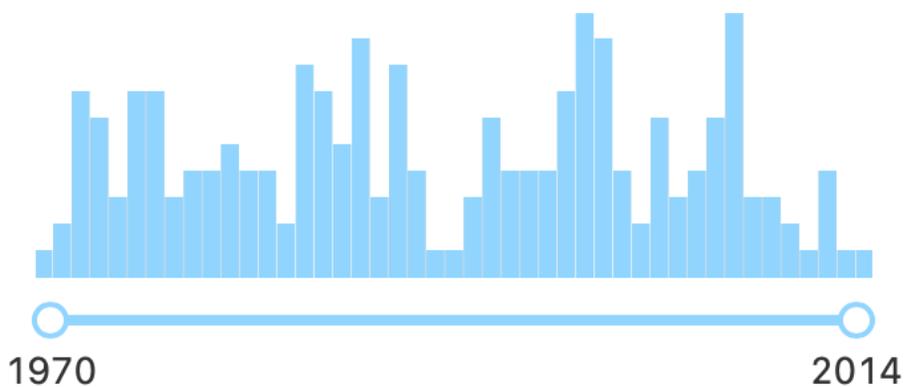
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Research works (202)

Cited By

Date of paper

202 results |

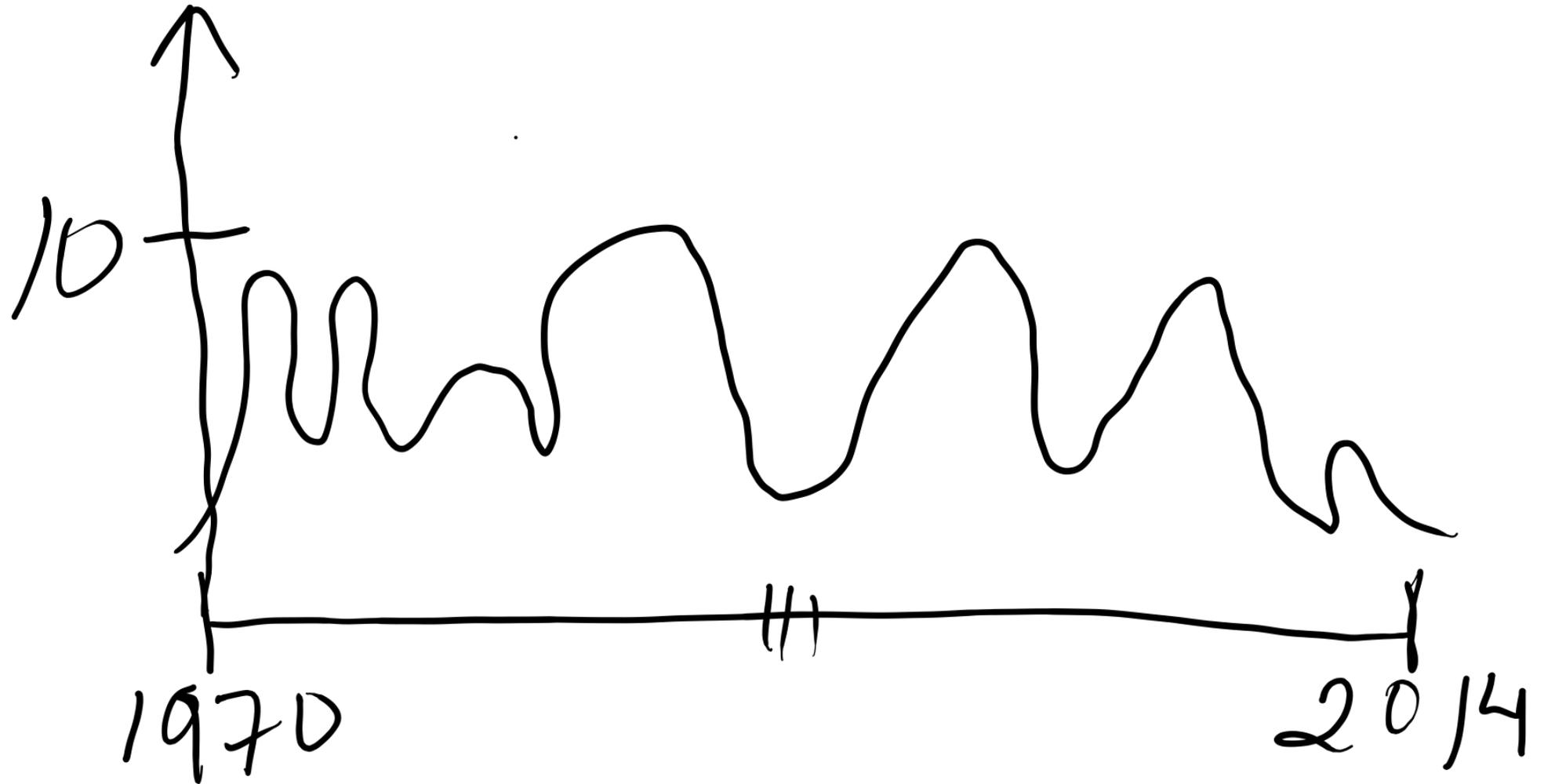


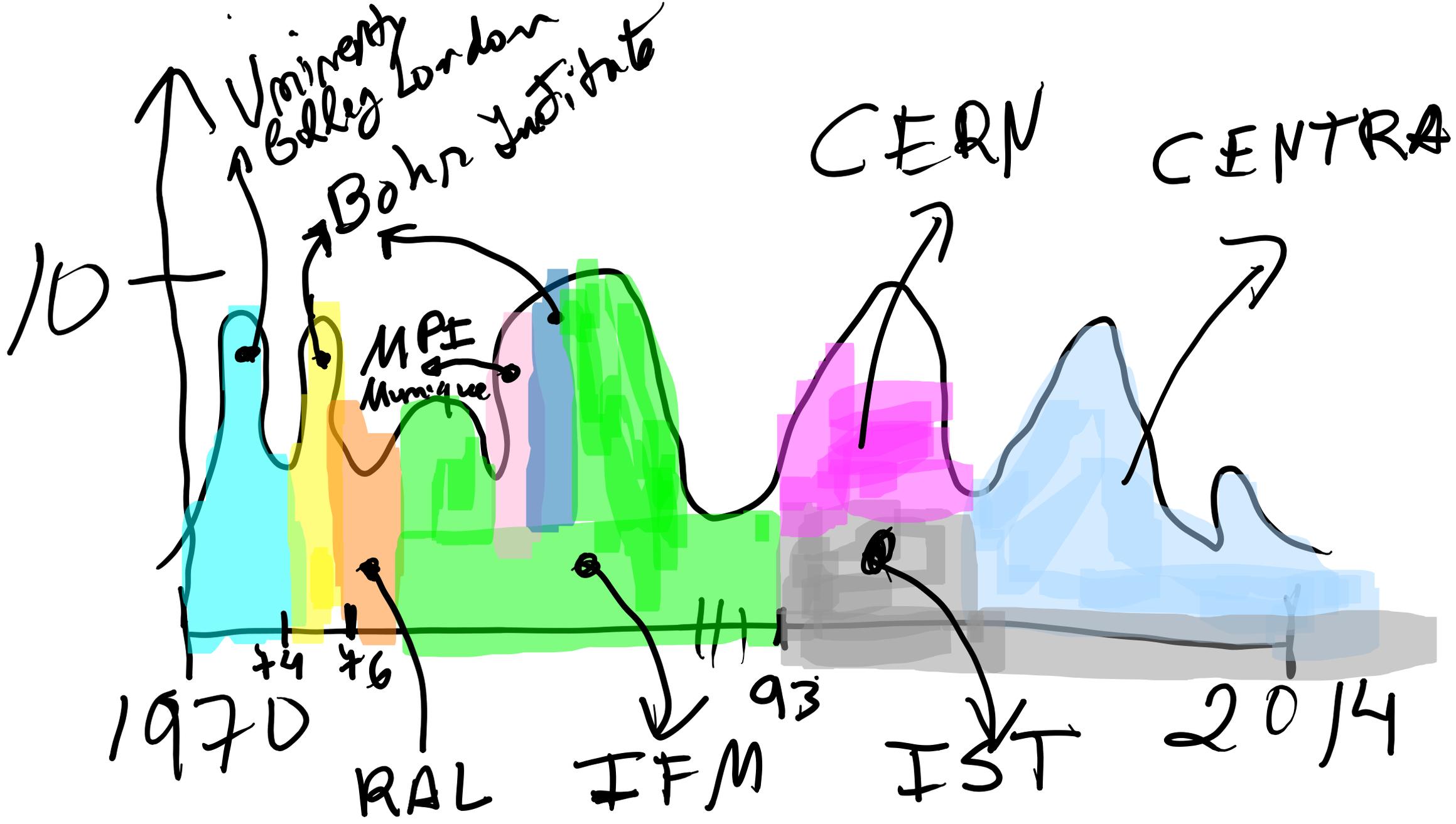
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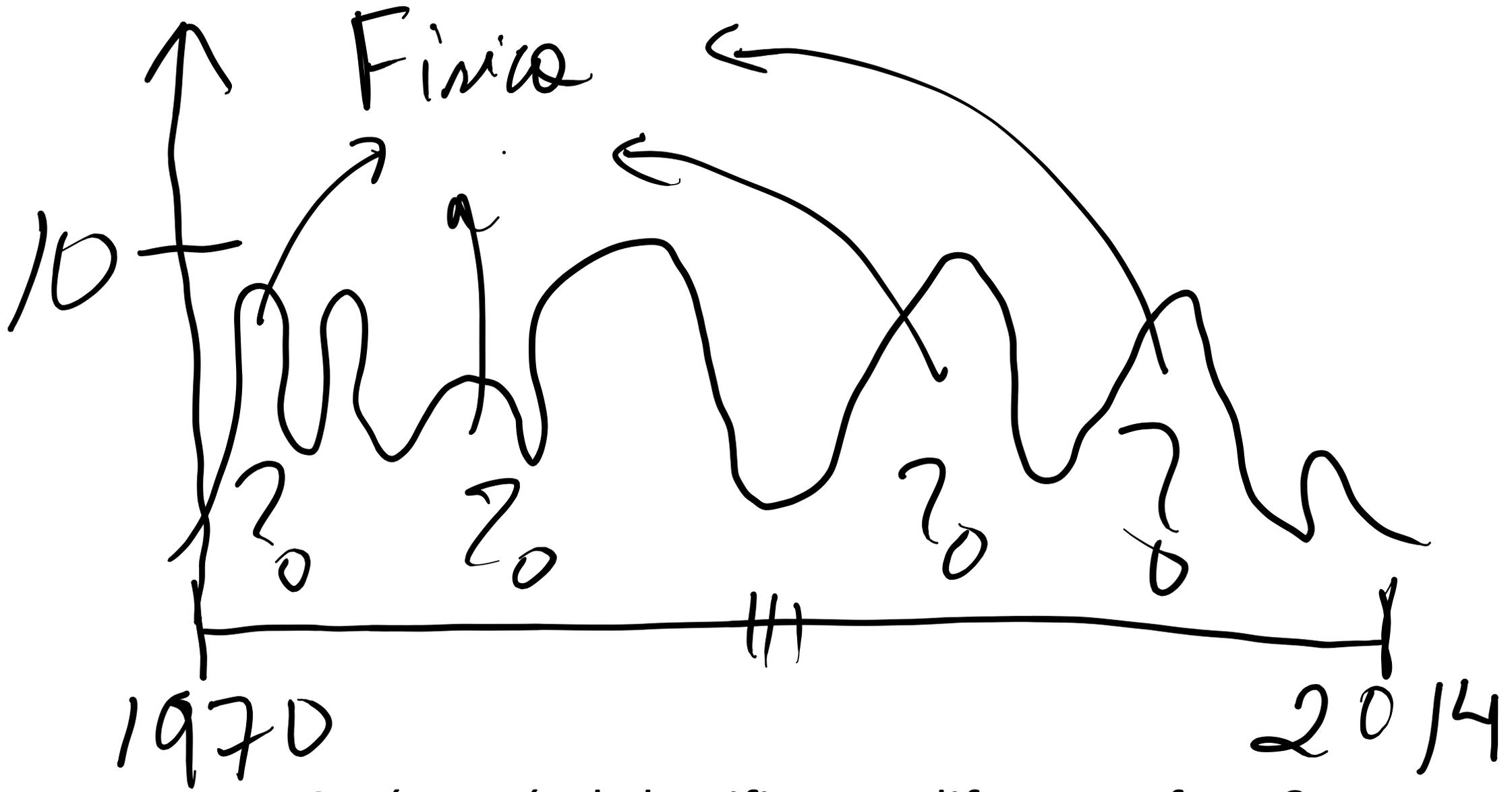
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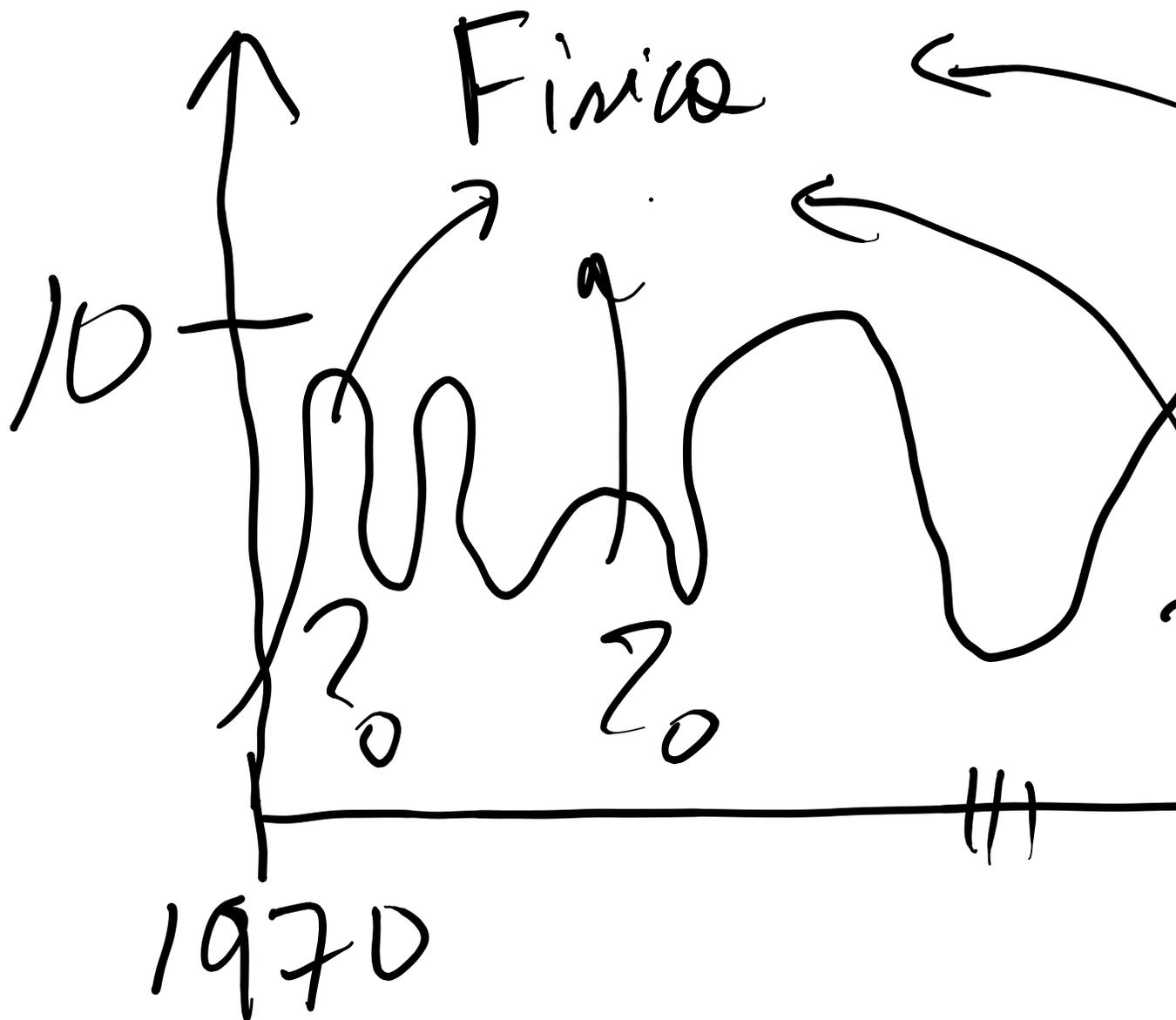
Como o JDD o faria...





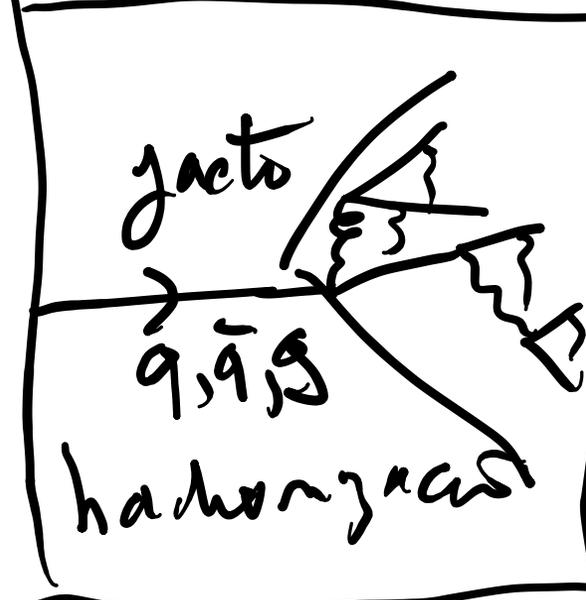
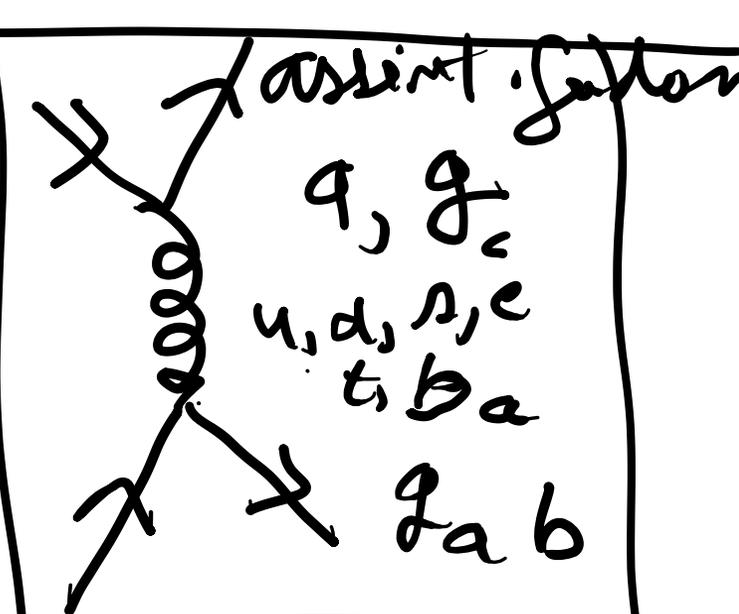
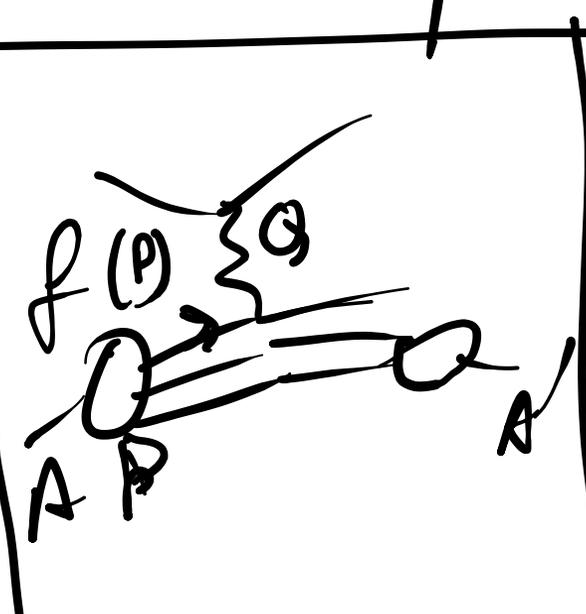
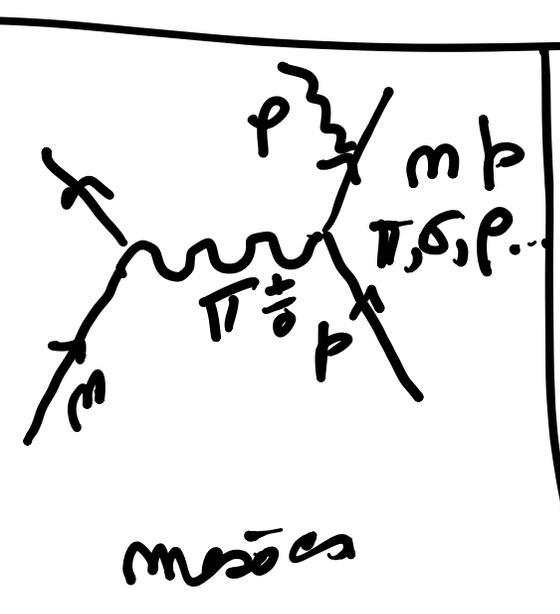
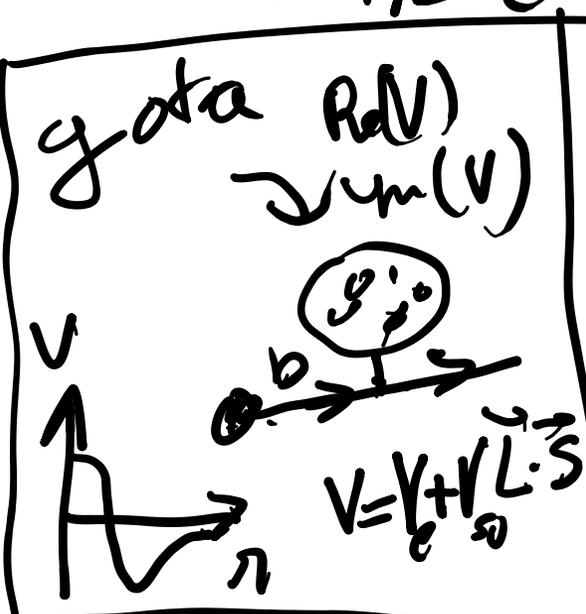


Será possível classificar as diferentes fases?



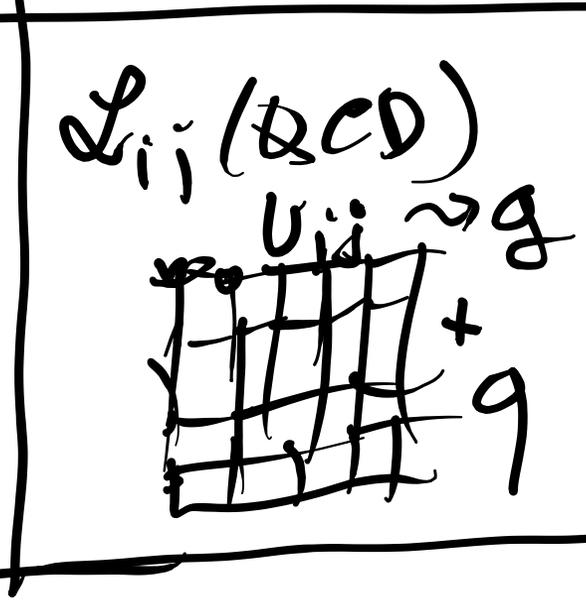
Será possível classificar as diferentes fases?

Física hadrônica aos quadrados inteiros



$$\frac{\mathcal{F}(A \rightarrow)}{\mathcal{F}(D \rightarrow)}$$

dependência em A



- 1- Fase de modelos relativistas de Quarks
 - 1971-
 - Tese de doutoramento:
“On dynamics of elementary particles derived from relativistic quark models”
University College Londo
 - Consequences of relativistic quark models for the interactions of hadrons 1971
 - 1972 –
 - Scattering of pions by any target in dual-resonance models
 - Triple-regge formulae in photo and electroproduction
 - Quarks, sum rules, and low-energy parameters in πn scattering
 - 1973 –
 - Scaling in partial wave inelasticities and KNO scaling
 - ...

- 2- Fase de Reggeon, Pomeron, Scaling ...

- 1975 –

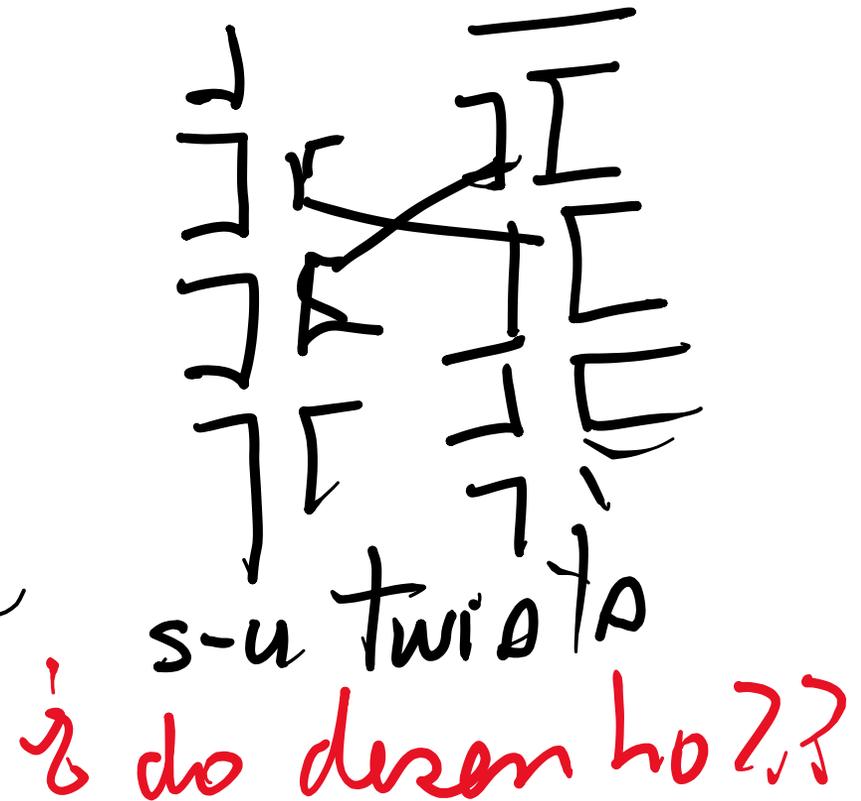
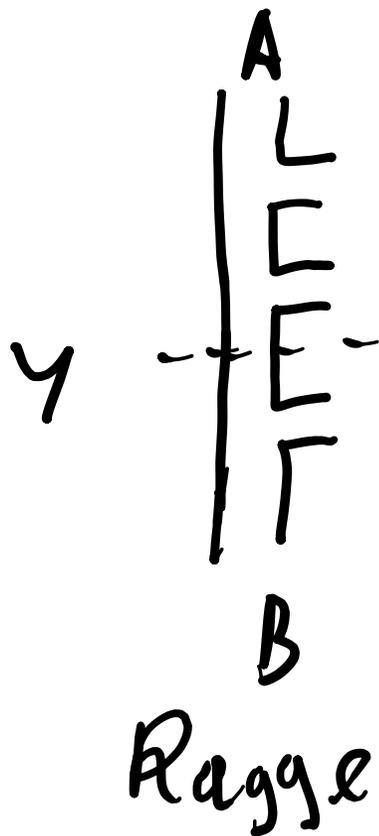
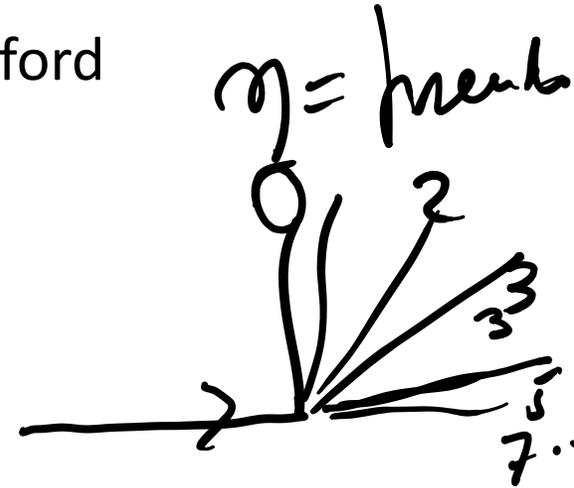
- On the Real Part of a Geometrical Pomeron
- Multiplicity Bootstrap and the Dual Unitarity Equation
- Local Loop Dominance in the Dual Unitarity Scheme
- Geometrical Scaling and the Real Part of the Pomeron
- Scaling Laws and Quark Model in High-Energy Strong Interactions
- A Simple Geometrical Approach to Particle Production in Collisions with Nuclei

- 1976 –

- Tests of Universality of Impact Parameter Distributions in High-Energy Hadron Collisions
- Reggeon Effects in a Geometrical Model of Elastic Scattering
- On the Systematics of Elastic Scattering at High and Intermediate-Energy
- Reggeon, Pomeron and Annihilation Processes in the Dual Unitarization Scheme
- [Quark Diagram Structure of Particle Production](#)

Quark Diagram Structure of Particle Production 1976 Ainda em Rutherford

- Conceito de Rapidity, $w = \text{arctanh}(v/c)$ na direção do feixe ...
- A composição de duas transformações de Lorenz soma a rapidity
 - Quark quality diagrams (??)



QUARK DIAGRAM STRUCTURE OF PARTICLE PRODUCTION

J. DIAS De DEUS¹ and S. JADACH²

Rutherford Laboratory, Chilton, Didcot, Oxon, OX11 0QX, UK

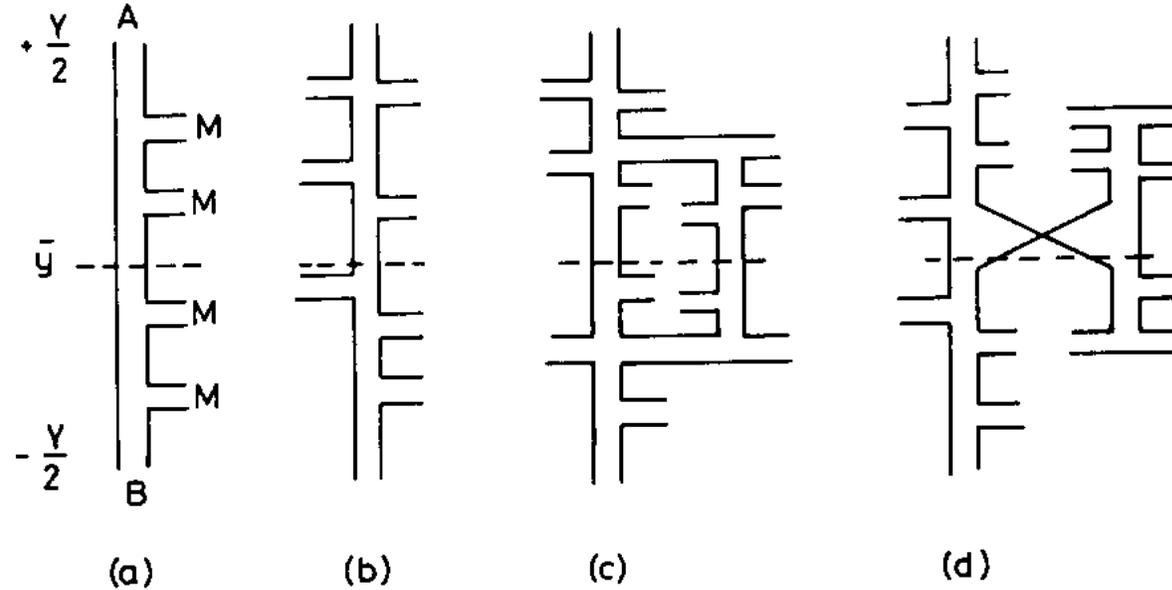
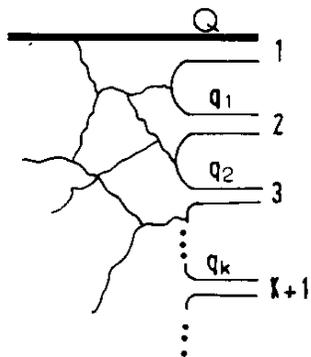


Fig. 1. Quark quark diagrams for processes of the following type (a) Regge, (b) Pomeron, (c) final state interaction; (d) s-u twists.

• 3- Fase: Milagres da estatística, multiplicidades e fragmentação

- 1977 –
 - Dual Quark Pattern for Multiplicities and Inclusive Distributions in Hadron and Lepton Induced Reactions
 - Dips, Zeros and Large $|t|$ Behavior of the Elastic Amplitude
- 1978 –
 - Phenomenology of Low-energy Scattering in the Framework of {QCD}
 - Light Quark and Heavy Quark Fragmentation Functions



At this stage we make the hypothesis that the probability amplitude for the decay of quarks Q, q_1, q_2, \dots into particles 1, 2, 3, ... respectively, is the same, i.e. the distribution function for producing particle 1 with momentum fraction z relative to the momentum of Q is the same as the distribution function for producing particle 2 with momentum fraction z relative to a given momentum of q_1 , etc. In this case the various $D_k(z)$ are related. We have for $D_2(z)$

$$zD_2(z) = \int_0^{1-z} z' D_1(z') \frac{z}{1-z'} D_1\left(\frac{z}{1-z'}\right) \frac{dz'}{z'}, \quad (3)$$

Fig. 1. Diagram for fragmentation of quark Q producing particle

• 3- Fase Cont. ...

- 1979 –
 - QUARKS AND HADRONS: STRUCTURE FUNCTIONS AND FRAGMENTATION FUNCTIONS.
- 1980 – Parentesis do Quarkonium...
 - PARTICLE TRAJECTORIES AND QUARKONIUM POTENTIALS 1980
 - Quarkonia With a Variational Method (Colaboração IFM ...)
 - A Comment on the Potential in Heavy Quarkonium Quantum Mechanical Systems
- 1980
 - Multiparticle Production and Long Range Correlations in $e^+e^-e^+e^-$ Annihilations and pppp High-energy Collisions.
- 1982
 - ARE TOO MANY BARYONS BEING PRODUCED IN $e^+ e^-$ ANNIHILATIONS? com M. Pimenta

Conclusions

Assumption 1. In hard jets (quarks, gluons) and fast hadrons (mesons, baryons) one of the quarks is always comparatively slow.

Assumption 2. For a given configuration of quarks and antiquarks the hadronization starts with creation of a slow $q\bar{q}$ pair. The weights attributed to each final state are given by the number of combinations, consistent with colour and momentum constraints, leading to it.

Finally we come to our initial question. Are too many baryons being produced in e^+e^- annihilations? Or, more generally, are too many baryons being produced in very energetic collisions? The answer seems to be yes, but that may just be a combinatorial effect.



- 4- Fase: Física de iões pesados, glueballs, ...
 - 1983-
 - HADRONIZATION OF QUARK SYSTEMS
 - MULTI - QUARK CLUSTERS IN NUCLEI AND THE EMC EFFECT
 - Structure Functions in Nuclei: Quark Clusters and Size Effects
 - On the A-dependence of Nuclear Structure Functions 1984
 - 1984 –
 - Semihard Physics at the {SPS} pp^-pp^- Colliders?
 - QUARK CLUSTERS IN NUCLEI AND QCD EVOLUTION
 - SECOND HAGEDORN TEMPERATURE AND GLUEBALL FORMATION
 - 1985 -
 - ARE GLUEBALLS FORMED AT HIGHER TEMPERATURE?
 - LEADING PARTICLE SPECTRUM AND IMPACT PARAMETER DISTRIBUTIONS AT VERY HIGH-ENERGIES
 - FROM FORWARD TO BACKWARD ELASTIC SCATTERING AT HIGH-ENERGY
 - SCALING LAWS IN HIGH-ENERGY HADRONIC INTERACTIONS, SEMIHARD PHYSICS ...
 - EMC EFFECT: THEORETICAL IDEAS AND MODELS
 - Fragmentation Functions in Nuclei

- 4- Fase Cont. ...

- 1985 –

- BACKWARD SCATTERING IN $\pi^- p \rightarrow p \pi^-$, $\bar{p} p \rightarrow \pi^+ \pi^-$, $K^- p \rightarrow p K^-$ AND $\bar{p} p \rightarrow p \bar{p}$ AT 8-GeV/c AND 12-GeV/c

CERN-Lisbon-Moscow-Neuchatel-College de France-Paris. Collaboration

- Lambda polarization in the K- fragmentation region

CERN-Lisbon-Moscow-Neuchatel-College de France-Paris. Collaboratio

A referência Google Maps de uma Colaboração!!!

- 1986 –

- Multiparticle Distributions in Limited Rapidity Intervals and the Violation of Asymptotic {KNO} Scaling
- CONSTRAINTS FOR QCD INSPIRED MODELS OF MULTIPARTICLE PRODUCTION

- 5- Fase jactos e mini-jactos ...

- 1987 –

- Semihard {QCD}: Mini - Jets and Elastic Scattering
 - SEMIHARD QCD: MINI - JETS, ELASTIC SCATTERING AND PARTICLE PRODUCTION BOUND FOR MULTIPARTICLE DISTRIBUTIONS IN MINIJET EVENTS FROM SEMIHARD QCD
 - Mini - Jets, Multiparticle Distributions and Forward - Backward Correlations 1987
 - ASYMPTOTIC BEHAVIOR OF BACKWARD ELASTIC SCATTERING

- 6- Fase intermitências ...

- 1988 –

- QUANTUM NUMBER FLOW IN DIFFRACTION DISSOCIATION OF MESON
 - Intermittency and Particle Correlations in Very Small Rapidity Intervals
 - LEADING CHARGES AND CHARGED PARTICLE DISTRIBUTIONS IN LIMITED RAPIDITY BINS
 - Fractal Behavior and Correlations in Rapidity Particle Distributions at High-energies
 - Intermittency in Multiparticle Distributions and One-dimensional Ising Systems

- 1991

- Intermittency and scaling in rapidity particle distributions

- 7- Fase inelasticity...

- 1993 –

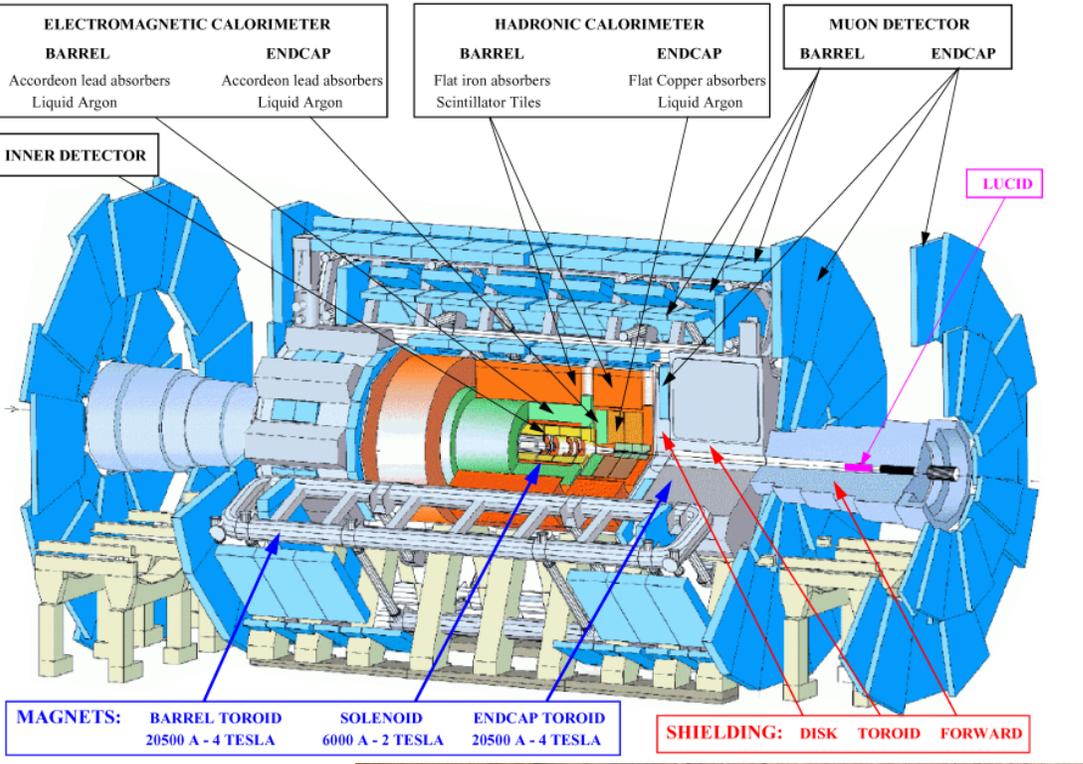
- On the energy dependence of inelasticity
 - Is the inelasticity decreasing with energy?
 - The Search of asymptopia in soft physics at high-energy

- 1994 –

- (Fase 6- Correlators and factorial moments in multiparticle distributions)
 - Nuclear antishadowing and the quarkonium nucleon elastic scattering amplitude
 - Heavy quarks and multiplicity distributions in $e^+ e^-$ annihilations
 - Cosmological neutrinos and Rydberg atoms
 - Leading heavy quarks, multiplicity distributions and correlations in $e^+ e^-$ annihilations
 - Heavy quark weak decays and multiparticle production in $e^+ e^-$ annihilations

- 1999-

- Soft and semihard components in multiplicity distributions at TeV energies
 - Absorption and percolation in the production of J / ψ in heavy ion collisions
 - The mysterious J / ψ suppression and quark gluon plasma formation



- 8- Fase Multiplicity ...
 - 2000 –
 - Particle densities in heavy ion collisions at high-energy and the dual string model
 - Particle rapidity density saturation in heavy ion collisions and the dual string model
 - Multiplicity distributions associated to subthreshold events in heavy ion collisions
- 9 – Fase Percolation/String model e multiparticle production
 - 2003 –
 - Schwinger model and string percolation in hadron hadron and heavy ion collisions
 - [Three papers on multiparticle production](#)
 - 2004-
 - An Estimate of the percolation parameter in heavy ion collisions
 - Universality of the transverse momentum distributions in the framework of percolation of strings
 - Multiplicity fluctuations in hadron-hadron and nucleus-nucleus collisions and percolation of strings

THREE PAPERS ON MULTIPARTICLE PRODUCTION

JORGE DIAS DE DEUS

Instituto Superior Técnico, Departamento de Física/CENTRA
Av. Rovisco Pais, 1049-001 Lisboa, Portugal

1. Paper I (1987)

minijets and multiparticle distributions [1]. The idea was to use the occurrence of minijets to generate, via unitarity, significant changes in elastic scattering and inelastic production [2–7].

2. Paper II (1999)

semi-hard components in multiplicity distributions at TeV energies [8]. The idea was much simpler than in Paper I and was inspired in the work of [9]. Ref. [9] successfully describes the shoulder of the multiplicity distribution at 1.8 TeV and the oscillations of the H_q moments.

3. Paper III (2003)

Who is right, who is wrong: Paper I or Paper II? In my opinion, they are both wrong! Paper II does not take into account the role of fluctuations in the number of collisions [10], or impact parameter fluctuations. Paper I does not take into account collective effects [11,12].

• 9- Fase Cont ...

- 2005 –
 - Large $p(T)$ distributions at RHIC and percolation of strings
- 2006 -
 - Percolation of color sources and critical temperature
 - Production of Secondaries in High Energy Heavy Ion Collisions
- 2007 -
 - A Simple evolution equation for rapidity distributions in nucleus-nucleus collisions.
 - Energy conservation and scaling violations in particle production
 - String Percolation and the Glasma
 - Clustering of color sources and the shear viscosity of the QGP in heavy ion collisions at RHIC and LHC energies 2012