

# **Working Group on Radiative Corrections and Generators for Low Energy Hadronic Cross Section and Luminosity**

Wednesday, 10 April 2013 - Friday, 12 April 2013

ECT

## **Book of Abstracts**



# Contents

Precision measurement of hadronic cross section with KLOE . . . . .	1
Update of hadronic cross section measurements at Babar . . . . .	1
Development of Monte Carlo generator for 3(pi+pi-) process study in CMD-3 experiment	1
MC generators at BES-III . . . . .	1
Introduction . . . . .	1
gamma-gamma physics at BES-III . . . . .	1
Measurement of time like TFF using ISR . . . . .	1
Report from meson transition form factor workshop . . . . .	1
Latest news from Novosibirsk . . . . .	2
Complete one loop corrections to $e^+e^- \rightarrow \mu^+\mu^- \gamma$ in PHOKHARA generator - an update . . . . .	2
TAUOLA MC and related projects . . . . .	2
Searching the Dark Photon at Mainz . . . . .	2
Search for Lorentz violation at KVI . . . . .	2
Light-by-Light Scattering Sum Rules . . . . .	2
Lattice QCD determination of the hadronic contribution of $(g-2)\mu$ . . . . .	2
The new $g-2$ experiment . . . . .	3
The anomalous magnetic moment, the polarization function and the QED beta function at five loop . . . . .	3
Effective field theory estimates of the hadronic contributions to $g-2$ . . . . .	3
Status of $g-2$ and Delta alpha . . . . .	3
$g-2.\alpha_{QED}$ . . . . .	3
Extraction of quark masses . . . . .	3
R-scan programme BES-III . . . . .	3

Simulation of e+e- annihilation into hadrons with PHOKHARA . . . . .	4
Looking for the phase interference between strong and EM in J/psi decays . . . . .	4
Discussion . . . . .	4
Overview ISR-Physics at BES-III . . . . .	4
Inclusive ISR -- Measurements B--Factories . . . . .	4
MC generator for e+e--> hadrons between 2--5 GeV . . . . .	4
Study of Y (4260) and Observation of Charged Zc at Belle . . . . .	4
Charged Zc at BESIII . . . . .	4
Discussion . . . . .	4
Status of the CMD-3 Experiment at VEPP-2000 . . . . .	5
Two--loop electroweak corrections to high--energy wide--angle Bhabha scattering . . .	5
Hadron form factors in pbar p=> e+ e-- annihilation: the role of radiative corrections .	5
FSR corrections to the process \$e^+ + e^- -> \bar{p} p \gamma\$: modelling and the implementation into the event generator PHOKHARA . . . . .	5
The Why's and How's of covariance matrices in the KLOE ISR analyses . . . . .	5
Time like TFF using ISR . . . . .	5
Estimated calculation of the hadronic light-by-light contribution to the (g-2) of the muon	5
Analysis of eta and eta--prime transition form factors within Pade approximants . . . .	6
gamma--gamma talk on BES--III . . . . .	6
gamma--gamma sum rules and their implication on the hadronic LbL contribution to (g-2)	6
White book on meson TFF . . . . .	6
Analytical calculation of a_mu from pi^+ + pi^- hadronic state, including RC to sigma_B(s) and RC to the kernel in point--like approximation for pion . . . . .	6
Muon g-2 and QCD sum rules . . . . .	6
Colloquium: The role of sigma_hadronic for the future of the precision determinations of the muon g-2 and the running alpha_em . . . . .	6
Discussion on RadioMotecarlow effort on aμ HAD evaluation . . . . .	7
Are isospin corrections in $\tau^- \rightarrow \pi^- \pi^0 \nu_\tau$ decays understood? . . . . .	7
Comparison of Resonance Chiral Lagrangian Currents to Experimental Data for $\tau \rightarrow \pi^- \pi^- \pi^+ \nu_\tau$	7
Discussion on RadioMotecarlow effort on aμ HAD evaluation . . . . .	7

Introduction . . . . .	7
------------------------	---



0

## **Precision measurement of hadronic cross section with KLOE**

1

## **Update of hadronic cross section measurements at Babar**

2

## **Development of Monte Carlo generator for 3(pi+pi-) process study in CMD-3 experiment**

3

## **MC generators at BES-III**

4

## **Introduction**

5

## **gamma-gamma physics at BES-III**

6

## **Measurement of time like TFF using ISR**

**Corresponding Author:** andrzej.kupsc@physics.uu.se

7

## **Report from meson transition form factor workshop**

**Corresponding Authors:** achim.denig@iekp.fzk.de, andrzej.kupsc@physics.uu.se

**8**

### **Latest news from Novosibirsk**

**9**

### **Complete one loop corrections to e+e -> mu+mu- gamma in PHOKHARA generator - an update**

**10**

### **TAUOLA MC and related projects**

**11**

### **Searching the Dark Photon at Mainz**

**12**

### **Search for Lorentz violation at KVI**

**Corresponding Author:** stefan.mueller@lnf.infn.it

**13**

### **Light-by-Light Scattering Sum Rules**

**14**

## **Lattice QCD determination of the hadronic contribution of (g-2)<sub>mu</sub>**

15

### **The new g-2 experiment**

16

### **The anomalous magnetic moment, the polarization function and the QED beta function at five loop**

17

### **Effective field theory estimates of the hadronic contributions to g-2**

18

### **Status of g-2 and Delta alpha**

**Corresponding Author:** thomas.teubner@liverpool.ac.uk

**Session I / 19**

### **g-2. alpha\_QED**

**Session I / 20**

### **Extraction of quark masses**

**Session II / 21**

### **R-scan programme BES-III**

**Session II / 22**

## **Simulation of e+e- annihilation into hadrons with PHOKHARA**

**Session II / 23**

## **Looking for the phase interference between strong and EM in J/psi decays**

**Session II / 24**

## **Discussion**

**Session III / 25**

## **Overview ISR-Physics at BES-III**

**Session III / 26**

## **Inclusive ISR -- Measurements B--Factories**

**Session III / 27**

## **MC generator for e+e--> hadrons between 2--5 GeV**

**Session IV / 28**

## **Study of Y (4260) and Observation of Charged Zc at Belle**

**Session IV / 29**

## **Charged Zc at BESIII**

Session IV / 30

## Discussion

Radiative Corrections and MC generators I / 31

### **Status of the CMD-3 Experiment at VEPP-2000**

Radiative Corrections and MC generators I / 32

### **Two--loop electroweak corrections to high--energy wide--angle Bhabha scattering**

Radiative Corrections and MC generators II / 33

### **Hadron form factors in pbar p=> e+ e-- annihilation: the role of radiative corrections**

Radiative Corrections and MC generators II / 34

### **FSR corrections to the process $e^+ + e^- \rightarrow \bar{p} p \gamma$ : modelling and the implementation into the event generator PHOKHARA**

Radiative Corrections and MC generators II / 35

### **The Why's and How's of covariance matrices in the KLOE ISR analyses**

Gamma Gamma physics, FSR and Transition Form Factors I / 36

### **Time like TFF using ISR**

Gamma Gamma physics, FSR and Transition Form Factors I / 37

**Estimated calculation of the hadronic light-by-light contribution to the (g-2) of the muon**

**Gamma Gamma physics, FSR and Transition Form Factors I / 38**

**Analysis of eta and eta--prime transition form factors within Pade approximants**

**Gamma Gamma physics, FSR and Transition Form Factors II / 39**

**gamma--gamma talk on BES--III**

**Gamma Gamma physics, FSR and Transition Form Factors II / 40**

**gamma--gamma sum rules and their implication on the hadronic LbL contribution to (g--2)**

**Gamma Gamma physics, FSR and Transition Form Factors II / 41**

**White book on meson TFF**

**Hadronic VP, g--2 and Delta alpha / 42**

**Analytical calculation of  $a_\mu$  from  $\pi^+\pi^-$  hadronic state, including RC to  $\sigma_B(s)$  and RC to the kernel in point--like approximation for pion**

**Hadronic VP, g--2 and Delta alpha / 43**

**Muon g--2 and QCD sum rules**

**Hadronic VP, g--2 and Delta alpha / 44**

**Colloquium: The role of sigma\_hadronic for the future of the**

**precision determinations of the muon g--2 and the running alpha\_em**

45

**Discussion on RadioMotecarlow effort on aμ HAD evaluation**

tau physics / 46

**Are isospin corrections in  $\tau^+ \rightarrow \pi^+ - \pi^0 \nu_\tau$  decays understood?**

tau physics / 47

**Comparison of Resonance Chiral Lagrangian Currents to Experimental Data for  $\tau \rightarrow \pi^- \pi^- \pi^+ \nu_\tau$**

48

**Discussion on RadioMotecarlow effort on aμ HAD evaluation**

Introduction: H. Czyz/G. Venanzoni / 49

**Introduction**