

Chap. 18: QED and initial state radiation studies

Session editors: Galina Pakhlova (Belle), Fabio Anulli (BaBar)

Chapter outline:

18	QED and initial state radiation studies
18.1	Introduction
18.2	Exclusive hadronic cross-sections
18.2.1	Measurement of $\pi^+\pi^-(\gamma)$
18.2.2	Hadronic contribution to $(g-2)_\mu$
18.2.3	Light mesons spectroscopy
18.2.4	Measurement of time-like baryons form factors
18.3	Open charm production
18.4	Search for exotic charmonium
18.5	Search for multilepton final states

ISR chapter: sections details

- 18.1 Introduction
 - ISR method
 - a bit theory
 - experimetal issues:
 - comparison with direct e+e- experiments
 - tagging vs untagging
 -

Aim of this introduction was to give :

- an idea of why it is still important to measure e+e- annihilation at low energies
- the basics of the ISR technique, which was developed at B (and phi) factories
- the different technique used for LQ and HQ hadrons

Basically fully written.

Some figure that needs to be produced.

Several details under discussion with Genia Solodov and Simon Eidelman

Positive comments received from general editors

ISR chapter: sections details

- 18.2 Exclusive cross sections
 - common analysis strategy
 - $p+\pi^-$ and contribution to $g-2$
 - other contributions to $g-2$
 - discussion on $g-2$ ($e+e^-$ and tau)
 - Light meson spectroscopy
 - results on ρ, ω, ϕ excitations
 - the $Y(2175)$
 - results on J/ψ and $\psi(2S)$
 - Baryon Form Factors

Michel Davier is working on it, I expect to receive its contribution in a couple of weeks at most.

Solodov sent a preliminary version of these subsection yesterday. Needs to be worked on, but it is a starting point.

This section refers only to Babar results (with exception of the $Y(2175)$)

- several subsections still missing

- Following comments and suggestions by general editors, I have shorten the subsection on “light meson spectroscopy” and I removed some figure reporting published cross sections.

- Since the meeting with general editors I have written the subsection on “baryon form factors”. I still have to work on it, but it is essentially complete.

ISR chapter: sections details

- 18.3 ISR to open charm
 - Introduction
 - $D^{(*)+}D^{(*)-}$
 - $D^0D^-\pi^+$
 - $D^0D^{*-}\pi^+$
 - $\Lambda_c^+\Lambda_c^-$
 - $D_S^{(*)+}D_S^{(*)-}$
 - Discussion and perspectives

- Most of channels studied by both Belle and BaBar
- The section has been fully rewritten by Galina Pakhlova and Antimo. Now is in a very good shape and ready for review.
- Inter-correlation with Charmonium chapters has been addressed with Riccardo Faccini and Pasha Pakhlov.
- Basically ready for review

ISR chapter: sections details

- 18.4 Search for exotic charmonium => Y family
 - Introduction
 - Y family in ISTR $J/\psi \pi^+\pi^-$
 - Y family in ISTR $\psi(2S) \pi^+\pi^-$

- Most of channels studied by both Belle and BaBar
- Shuwei Ye wrote the entire subsection, including results from both experiments.
- After discussion with general editors, I have reorganized the subsection, which is now significantly shorter. Waiting feedback by Shuwei and Riccardo Faccini.
- It is now in a rough shape, but it should require too much effort to adjust.

- 18.5 Search for dark bosons in multi-lepton final states
 - Short introduction on DF
 - search for 4 lepton final state

- One analysis ongoing in BaBar (Matt Graham)
- Preliminary text sent long ago by Matt and Bertrand.

Summary ISR chapter

- Writing has started for all sections
- Several complete and in good shape
- Other have only a first draft
- Co-editors have been in touch more or less regularly
 - review is proceeding in two parallel paths:
 - general issues (length, level of details, balance between Babar and Belle material) discussed among co-editors
 - specific issues on subsection discussed directly with co-writers
- A complete draft of the whole chapter possibly ready before the end of the year with already a significant level of review
- The whole chapter is still too long, but we could work on that during the review process

Chap. 21.1: QCD and related physics: Fragmentation Functions

Section outline:

- Theory introduction
- Unpolarized FF
 - Light hadrons
 - Charmed hadrons
- Polarized FF
 - Collins asymmetries
 - Interference asymmetries

Editors:

Fabio Anulli (BABAR)

Ralf Seidl (Belle)

Shunzo Kumano (theory)

- At Annecy, only the section on polarized FF (plus a rough version of the section on unpolarized FF for charmed hadrons) was written by Ralf Seidl
- Limited inter-correlation with charmed baryons, and Baryonic B decays sections

QCD frag. chapter: present status

- Presently all sections have been written (several new contribution provided by Dave Muller)
- However all new text has been uploaded in the last week, so no review has been performed yet.
- Introduction:
 - written independently by Ralf and Dave ==> the two version should be merged
- Unpolarized FF (introduction + light charged hadrons):
 - written by Dave, and essentially complete
 - old preliminary results by Babar included. Unprobable that new Babar analysis will be ready in time, but this subsection is essential for the completeness of the chapter
- Unpolarized charmed FF:
 - rewritten by Dave. To be completed
- Polarized FF: review is started and Ralf has uploaded a new version after comments by general editors and myself
- It is reasonable to have the Chapter in good shape by the end of the year