

Radiative & Electroweak Penguins

Section Editors

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B-factories Legacy Book Meeting
SLAC, Oct 30-31

Papers published by BaBar

- 1) $K^*\gamma$ (PRL 2009), (PRD 2004), (PRL 2002)
- 2) $d\gamma$ (PRL 2009)
- 3) $K^*\pi$ rates (PRL 2009), (PRD 2006), (PRL 2003), (PRL 2002)
- 4) $K^*\pi$ angular analysis (PRD 2009)
- 5) $K_{\text{spi0}}\gamma$ CP(t) (PRD 2008), (PRD 2004), (PRL 2004)
- 6) $\rho(\omega)\gamma$ (PRD 2008), (PRL 2007), (PRL 2005), (PRL 2004)
- 7) $\eta K\gamma$ (PRD 2009), (PRD 2006)
- 8) ACP($b \rightarrow s\gamma$) (PRL 2008), (PRL 2004)
- 9) BRECO $b \rightarrow s\gamma$ (PRD 2008)
- 10) Search for $b \rightarrow p\pi$ (PRL 2007)
- 11) $\phi K\gamma$ (PRD 2007)
- 12) Inclusive $b \rightarrow s\gamma$ (PRL 2006)
- 13) Sum of exclusive $b \rightarrow s\gamma$ (PRD 2005)
- 14) $K_{\text{pipi}}\gamma$ (PRL 2007)
- 15) $B_0 \rightarrow \phi\gamma$ (PRD 2005)
- 16) Sum of exclusive $b \rightarrow s\pi$ (PRL 2004)
- 17) $B_0 \rightarrow \gamma\gamma$ (PRL 2001)

Papers published by Belle

- 1) $K\eta'$ γ (PRD 2009)
- 2) Inclusive $b \rightarrow s \gamma$ (PRL 2009), (PRL 2004)
- 3) $K^* \Pi$ (PRL 2009), (PRL 2006), (PRL 2003)
- 4) $K_s \rho^0 \gamma$ (PRL 2008)
- 5) $\rho(\omega) \gamma$ (PRL 2008), (PRL 2006), (PRD 2005)
- 6) Search for $\pi \Pi$ (PRD 2008)
- 7) Moments in $b \rightarrow s \gamma$ (PRD 2008)
- 8) $B_s \rightarrow \phi \gamma$ (PRL 2008)
- 9) $\rho^0 \gamma$ ACP(t) (PRL 2008)
- 10) $K_{sp}^0 \gamma$ ACP(t) (PRD 2006), (PRL 2005)
- 11) $B^0 \rightarrow \gamma \gamma$ (PRD 2005)
- 12) $B \rightarrow \bar{p} \Lambda \gamma$ (PRL 2005)
- 13) Sum of exclusive $b \rightarrow s \Pi$ (PRD 2005), (PRL 2003)
- 14) $B \rightarrow K_1(1270) \gamma$ (PRL 2005)
- 15) $K \eta \gamma$ (PLB 2005)
- 16) ACP($b \rightarrow s \gamma$) (PRL 2004)
- 17) $K^* \gamma$ (PRD 2004)
- 18) $\phi K \gamma$ (PRL 2004)
- 19) $K \pi(\pi) \gamma$ (PRL 2002)
- 20) $K \Pi$ (PRL 2002)
- 21) Sum of exclusive $b \rightarrow s \gamma$ (PLB 2001)

Papers to come?

Foreseen BaBar papers in time to be included in the book:

- 1) Fully inclusive $b \rightarrow s\gamma$
- 2) $d\gamma$ (update)
- 3) $K^*\ell$ angular analysis (update)
- 4) sll inclusive

Foreseen Belle papers in time to be included in the book :

- 1) Sum of exclusive $b \rightarrow s\gamma$
- 2) $d\gamma$
- 3) $K^*\ell$ (update)
- 4) sll inclusive

Summary of papers (BaBar+Belle):

$$\text{PRL: } 16 + 17 = 33$$

$$\text{PRD: } 12 + 8 = 20$$

$$\text{PLB : } 0 + 2 = 2$$

Section subdivision

Section Radiative & Electroweak Penguin Decays (30 pages)

Subsection Theory (4 pages)

Subsubsection Heavy Quark OPE

Subsubsection Form Factors (sum rules & SCET)

Subsubsection New Physics

Subsection Inclusive $b \rightarrow s\gamma$ (6 pages)

Subsubsection Fully inclusive (+ lepton-tagged)

Subsubsection BRECO tagged

Subsubsection Sum of exclusives

Subsubsection Direct CP and A_I

Subsubsection Spectral shape, moments, extrapolation

Subsubsection World averages

Subsection Exclusive $b \rightarrow s\gamma$ (4 pages)

Subsubsection $B \rightarrow K^*\gamma$ (BF , A_{CP} , A_I)

Subsubsection Other exclusive $b \rightarrow s\gamma$

Subsubsection $B_s \rightarrow \phi\gamma$

Subsection $b \rightarrow d\gamma$ (3 pages)

Subsubsection $B \rightarrow \rho(\omega)\gamma$ (BF , A_{CP} , A_I)

Subsubsection Inclusive $b \rightarrow d\gamma$

Subsubsection Extraction of V_{td}/V_{ts} ?

Section subdivision

Subsection Time-dependent CP violation (3 pages)

Subsubsection $B \rightarrow K\pi^0\gamma$, $B \rightarrow K\eta\gamma$

Subsubsection $B \rightarrow K\rho\gamma$, $B \rightarrow K\phi\gamma$

Subsubsection $B \rightarrow \rho\gamma$

Subsection $b \rightarrow sll$ (6 pages)

Subsubsection $B \rightarrow K^{(*)}ll$ (BF , A_{CP} , A_l , R_L)

Subsubsection $B \rightarrow K^{*}ll$ angular analysis

Subsubsection $b \rightarrow sll$ sum of exclusives

Subsection $b \rightarrow svv$ (2 pages)?

Subsubsection $B \rightarrow K^{(*)}vv$, $pivv$?

Subsection Searches for other decays (2 pages)

Subsubsection $B \rightarrow \gamma\gamma$

Subsubsection $B \rightarrow p\bar{p}ll$

Subsubsection Lepton flavour violation

Inter-correlations with Radiative & Electroweak Penguins

	related to	Foreseen resolution:
Subsection Theory	Sections V_{ub}/V_{cb} , Charmless	Put OPE, form factors into separate theory Tools section?
Subsection Inclusive $b \rightarrow s\gamma$	Section V_{ub}/V_{cb}	Not clear where HQE parameters are discussed
Subsection Time-dependent CP violation	Section ϕ_1 Section Vertexing	Put methods into Tools?
Subsubsection Exclusive $B_s \rightarrow \phi\gamma$	Section $Y(5S)$	Could be in either
Subsection $b \rightarrow s\nu\nu$	Section leptonic Section BRECO	Could be in leptonic?
Subsection $b \rightarrow d\gamma$	Section V_{td}/V_{ts}	We just describe BF
Subsubsection $B \rightarrow K^*\ell\ell$ angular analysis	Sections $B \rightarrow \text{charm}$, Charmless	Angular variables introduced earlier?

Inter-correlations (cont.)

Subsubsection Lepton
Flavour Violation

related to

Sections Leptonic,
Tau, Other?

Foreseen resolution:

Where is this physics
discussed?

Subsubsection Other
exclusive $b \rightarrow s\gamma$

Sections $B \rightarrow$ baryons,
Charmless

Fragmentation into
baryons and higher
resonances discussed
elsewhere?

Subsection $b \rightarrow sv\bar{v}$,
Subsubsection $B \rightarrow K^{(*)} \Pi$

Section Bottomonium

Where is Higgs/dark
particles discussion?

Contributors

Confirmed (beside section editors)

BaBar: Gerald Eigen, Jurgen Kroseberg, John Walsh

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