

Dalitz plot analyses

Section Editors

BaBar: Thomas Latham

Belle: Anton Poluektov

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Dalitz analysis papers

- Many papers that use Dalitz analysis in some form
 - This is a «Tools» section: the papers will illustrate various analysis approaches, all of them will be reviewed in the physics sections

 - PRD: 14 (BaBar) + 13 (Belle)
 - PRL: 3 (BaBar) + 6 (Belle)
 - PLB: 3 (Belle)
- (preliminary numbers, probably incomplete)

BaBar Papers

1. Measurement of γ in $B^+ \rightarrow D^{(*)} K^+ \pi^- \pi^+$ decays with a Dalitz analysis of $D \rightarrow K_0^*(S) \pi^- \pi^+$
Phys.Rev.Lett.95:121802,2005 hep-ex/0504039
2. Improved measurement of the CKM angle γ in $B^+ \rightarrow D^{(*)} K^{(*)+} \pi^- \pi^+$ decays with a Dalitz plot analysis of D decays to $K_0^*(S) \pi^+ \pi^-$ and $K_0^*(S) K^+ K^-$
Phys.Rev.D78:034023,2008 arXiv:0804.2089 [hep-ex]
3. Dalitz plot analysis of $D_0 \rightarrow \text{anti-}K_0^* K^+ K^-$
Phys.Rev.D72:052008,2005 hep-ex/0507026
4. Amplitude analysis of the decay $D_0 \rightarrow K^- K^+ \pi_0$
Phys.Rev.D76:011102,2007 arXiv:0704.3593 [hep-ex]
5. Dalitz Plot Analysis of $D(s)^+ \rightarrow \pi^+ \pi^- \pi^+$
Phys.Rev.D79:032003,2009 arXiv:0808.0971 [hep-ex]
6. Dalitz Plot Analysis of the Decay $B_0(\text{anti-}B_0) \rightarrow K^+ \pi^- \pi^+$
Phys.Rev.D78:052005,2008 arXiv:0711.4417 [hep-ex]
7. An Amplitude analysis of the decay $B^+ \rightarrow \pi^+ \pi^+ \pi^-$
Phys.Rev.D72:052002,2005 hep-ex/0507025
8. Dalitz-plot analysis of the decays $B^+ \rightarrow K^+ \pi^- \pi^+$
Phys.Rev.D72:072003,2005 hep-ex/0507004
9. Dalitz plot analysis of the decay $B^+ \rightarrow K^+ K^- K^+$
Phys.Rev.D74:032003,2006 hep-ex/0605003
10. Time-dependent amplitude analysis of $B_0 \rightarrow K_0^*(S) \pi^+ \pi^-$
Accepted by Physical Review D arXiv:0905.3615 [hep-ex]
11. Evidence for Direct CP Violation from Dalitz-plot analysis of $B^+ \rightarrow K^+ \pi^- \pi^+$
Phys.Rev.D78:012004,2008 arXiv:0803.4451 [hep-ex]
12. Measurements of CP-violating asymmetries in the decay $B_0 \rightarrow K^+ K^- K_0$
Phys.Rev.Lett.99:161802,2007 arXiv:0706.3885 [hep-ex]
13. Measurement of CP-violating asymmetries in $B_0 \rightarrow (\rho \pi)_0$ using a time-dependent Dalitz plot analysis
Phys.Rev.D76:012004,2007 hep-ex/0703008
14. Dalitz Plot Analysis of $B^+ \rightarrow \pi^+ \pi^- \pi^+$ Decays
Phys.Rev.D79:072006,2009 arXiv:0902.2051 [hep-ex]
15. Time-dependent Dalitz plot analysis of $B_0 \rightarrow D^+ K_0^* \pi^-$ decays
Phys.Rev.D77:071102,2008 arXiv:0712.3469 [hep-ex]
16. Dalitz Plot Analysis of $B^- \rightarrow D^+ \pi^- \pi^-$
Phys.Rev.D79:112004,2009 arXiv:0901.1291 [hep-ex]
17. Measurement of CP Violation Parameters with a Dalitz Plot Analysis of $B^+ \rightarrow D(\pi^+ \pi^- \pi_0) K^+$
Phys.Rev.Lett.99:251801,2007 hep-ex/0703037

Belle Papers

1. Study of three-body charmless B decays. A.Garmash, et al. PRD 65, 092005 (2002), hep-ex/0201007
2. Study of $B \rightarrow \rho \pi$ decays at Belle. A.Gordon, Y.Chao, et al. PLB 542, 183 (2002), hep-ex/0207007
3. Study of $B_0 \rightarrow D^{(*)0} \pi^+ \pi^-$ Decays. A.Satpathy, et al. PLB 553, 159 (2003), hep-ex/0211022
4. Study of $B^- \rightarrow D^{*0} \pi^- (D^{*0} \rightarrow D^{*+} \pi^-)$ decays. K.Abe, et al. PRD 69, 112002 (2004), hep-ex/0307021
5. Study of B meson decays to three-body charmless hadronic final states. A.Garmash, et al. PRD 69, 012001 (2004), hep-ex/0307082
6. Measurement of ϕ_3 with Dalitz Plot Analysis of $B \rightarrow D^{(*)} K$ Decay. A.Poluektov, et al, PRD 70, 072003 (2004), hep-ex/0406067
7. Observation of the Decays $B_0 \rightarrow K \pi \pi^0$ and $B_0 \rightarrow \rho K^+$. P. Chang, et al, PLB 599, 148(2004), hep-ex/0406075
8. Dalitz analysis of the three-body charmless decays $B^+ \rightarrow K \pi \pi^-$ and $B^+ \rightarrow K^+ K^+ K^-$. A.Garmash, et al. PRD 71, 092003 (2005), hep-ex/0412066
9. Evidence for Large Direct CP Violation in $B^+ \rightarrow \rho(770)^0 K^+$ from Analysis of the Three-Body Charmless $B^+ \rightarrow K^+ \pi^+ \pi^+$ Decay. A.Garmash et al. PRL 96, 251803 (2006), hep-ex/0512066
10. Measurement of ϕ_3 with Dalitz plot analysis of $B^+ \rightarrow D^{(*)} K^{(*)+}$ decay. A. Poluektov et al. PRD 73, 112009 (2006), hep-ex/0604054
11. Measurement of the Quark Mixing Parameter $\cos^2 \phi_1$ Using Time-Dependent Dalitz Analysis of $B_0 \rightarrow D[K_s \pi^+ \pi^-]$ h0. P.Krokovny et al. PRL 97, 081801 (2006), hep-ex/0605023
12. Dalitz Analysis of Three-body Charmless $B_0 \rightarrow K_0 \pi^+ \pi^-$ Decay. A. Garmash et al. PRD 75, 012006 (2007), hep-ex/0610081
13. Study of decay mechanisms in $B^- \rightarrow \Lambda_{c^+} \bar{p} \pi^-$ decay and observation of anomalous structure in the $(\Lambda_{c^+} \bar{p})$ system. N.Gabyshev et al. PRL 97, 242001 (2006), hep-ex/0409005
14. Study of $B_0 \rightarrow D_0 \pi^+ \pi^-$ decays. A.Kuzmin et al. PRD 76, 012006 (2007), hep-ex/0611054
15. Measurement of CP Asymmetry in a Time Dependent Dalitz Analysis of $B_0 \rightarrow (\rho \pi)^0$ and a Constraint on the CKM Angle ϕ_2 . A. Kusaka, C. C. Wang, H. Ishino et al., PRL 98, 221602 (2007), hep-ex/0701015
16. Measurement of D_0 - D_0 bar mixing in $D_0 \rightarrow K_s \pi^+ \pi^-$ decays. L.M.Zhang, Z.P.Zhang et al. PRL 99, 131803 (2007) arXiv:0704.1000[hep-ex]
17. Observation of a new $D_s J$ meson in $B^+ \rightarrow D_0 B D_0 K^+$ decays. J. Brodzicka, H. Palka et al. PRL 100, 092001 (2008), arXiv:0707.3491v1[hep-ex]
18. Measurement of CP asymmetries and branching fractions in a time-dependent Dalitz analysis of $B_0 \rightarrow (\rho \pi)^0$ and a constraint on the quark mixing angle ϕ_2 . A. Kusaka, C.-C. Wang et al. PRD 77, 072001 (2008)
19. Observation of two resonance-like structures in the $\pi^+ \chi_{c1}$ mass distribution in exclusive B_0 to $K^- \pi^+ \chi_{c1}$ decays. R. Mizuk, R. Chistov et al. PRD 78, 072004 (2008), arXiv:0806.4098[hep-ex]
20. Time-dependent Dalitz Plot Measurement of CP Parameters in $B_0 \rightarrow K_s \pi^+ \pi^-$ Decays. J. Dalseno et al. PRD 79, 072004 (2009), arXiv:0811.3665[hep-ex]
21. Dalitz analysis of $B \rightarrow K \pi \psi'$ decays and the $Z(4430)^+$. R.Mizuk et al. PRD 80, 031104 (2009), arXiv:0905.2869[hep-ex]
22. Measurement of γ_{CP} in D_0 meson decays to the $K_s K^+ K^-$ final state. A. Zupanc et al. PRD 80, 052006 (2009), arXiv:0905.4185[hep-ex]

Section subdivision

- Introductory part
 - Concept of a DP, the general ideas behind DP fits.
 - Physics motivations behind DP analyses: searches for new states, measuring resonance properties, CP violation, B and D mixing, resolving ambiguities.
- Formalisms - isobar, K matrix.
 - Lineshapes, angular terms, barrier factors.
 - Different ways of parameterising the complex coefficients.
- Extensions:
 - Square Dalitz plot (various forms).
 - Time-dependence.
 - Non-scalar particles in the final state.
- Effects of efficiency, backgrounds, self cross feed, resolution.
 - Technical issues
Binned vs unbinned fits, approaches for normalisation, adaptive binning, nonparametric backgrounds.

Approximate expected # pages
needed for whole section: ~ 20

Inter-correlation

- Physics sections that contain Dalitz analysis results:
 - Charmed and charmless B decays
 - Charm decays
 - Charmonia
 - D mixing
 - CKM angles
- Relies on the following Tools sections:
 - Maximum likelihood fits
 - Unbinned fits

Contributors (preliminary)

BaBar: Eli Ben-Haim, Mathew Graham, Antimo Palano,
Brian Meadows, Fernando Martinez-Vidal, Bill Dunwoodie,
Gianluca Cavoto

Belle: Alex Kuzmin, Alex Bondar, Alexei Garmash, Roman Mizuk

Unconfirmed yet (except A. Palano).