Erratum: Phenomenological analysis of charmless decays $B\to PV$ with QCD factorization [Phys. Rev. D 65, 094025 (2002)]

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(1) On page 094025-6, the formula (2.9b),

$$H'(BP,V)=-\frac{f_B f_P}{m_B^2 F_1^{B\to P}}\int_0^1 d\xi\int_0^1 dx\int_0^1 dy\frac{\Phi_B(\xi)}{\xi}\frac{\Phi_V(x)}{x}\times\left[\frac{\Phi_P(y)}{\bar{y}}+\frac{2\mu_P}{m}\frac{x}{\bar{x}}\frac{\Phi_P^p(y)}{\bar{y}}\right].$$

should read

$$H'(BP,V)=\frac{f_B f_P}{m_B^2 F_1^{B\to P}}\int_0^1 d\xi\int_0^1 dx\int_0^1 dy\frac{\Phi_B(\xi)}{\xi}\frac{\Phi_V(x)}{x}\left[\frac{\Phi_P(y)}{\bar{y}}+\frac{2\mu_P}{m}\frac{x}{\bar{x}}\frac{\Phi_P^p(y)}{\bar{y}}\right]. \tag{2.9b}$$

There is a minus sign error on the right-hand side.

(2) On page 094025-8, the formula (2.14b)

$$A_3^i(V,P)\simeq\pi\alpha_s r_\chi[2\pi^2-6(X_A^2+2X_A)],$$

TABLE IV. *CP*-averaged branching ratios (in units of 10^{-6}) of decays $B\to PV$ for $b\to d$ transitions with central values of various parameters. The results in columns 2–4 are calculated with $A=0.819$, $\lambda=0.2237$, $\bar{\rho}=0.218$, and $\bar{\eta}=0.316$, while the results in columns 5–7 are computed with $A=0.83$, $\lambda=0.222$, $\bar{\rho}=0.05$, and $\bar{\eta}=0.381$.

Decay modes	NF	QCDF		NF	QCDF		Decay modes	NF	QCDF		NF	QCDF	
	BR	BR^f	BR^{f+a}	BR	BR^f	BR^{f+a}		BR	BR^f	BR^{f+a}	BR	BR^f	BR^{f+a}
$\bar{B}^0\to K^0\bar{K}^{*0}$	0.023	0.034	0.040	0.034	0.050	0.061	$\bar{B}^0\to\eta'\omega$	0.161	0.061	0.068	0.162	0.063	0.072
		0.034	0.042		0.050	0.064			0.063	0.069		0.071	0.082
$\bar{B}^0\to\bar{K}^0K^{*0}$	0.132	0.198	0.210	0.191	0.270	0.293	$\bar{\mathbf{B}}^{\mathbf{0}}\to\eta\phi$	0.0001	**0.0004**	0.0005	0.0002	**0.0006**	0.0007
		0.198	0.207		0.270	0.289			**0.0008**	0.0007		**0.0011**	0.0010
$\bar{B}^0\to K^\pm K^{*\mp}$	—	—	0.019	—	—	0.019	$\bar{\mathbf{B}}^{\mathbf{0}}\to\eta'\phi$	0.0001	**0.0003**	**0.0002**	0.0001	**0.0004**	**0.0003**
		—	0.019		—	0.019			**0.0006**	**0.0007**		**0.0009**	**0.0010**
$\bar{B}^0\to\pi^-\rho^+$	9.231	9.685	10.13	9.31	9.836	10.28	$B^-\to\pi^-\rho^0$	7.758	6.464	6.498	8.125	6.949	6.954
		9.685	10.13		9.836	10.28			6.464	6.498		6.949	6.954
$\bar{B}^0\to\pi^+\rho^-$	21.59	22.72	23.36	19.8	20.70	21.34	$B^-\to\pi^-\omega$	7.988	7.08	6.977	7.292	6.349	6.260
		22.78	23.42		20.71	21.36			6.97	6.868		6.405	6.313
$\bar{B}^0\to\pi^0\rho^0$	0.452	0.132	0.139	0.434	0.124	0.127	$\mathbf{B}^-\to\pi^-\phi$	0.0006	**0.0012**	—	0.0009	**0.0017**	—
		0.132	0.137		0.123	0.128			**0.0037**	—		**0.0054**	—
$\bar{\mathbf{B}}^{\mathbf{0}}\to\pi^0\omega$	0.022	**0.035**	**0.022**	0.016	**0.027**	**0.027**	$B^-\to\pi^0\rho^-$	14.64	13.55	13.54	13.05	11.91	11.97
		0.021	**0.011**		**0.015**	**0.011**			13.55	13.54		11.91	11.97
$\bar{\mathbf{B}}^{\mathbf{0}}\to\pi^0\phi$	0.0003	**0.0006**	—	0.0004	**0.0008**	—	$B^-\to\eta\rho^-$	6.627	5.879	5.798	6.197	5.489	5.415
		0.0017	—		**0.0025**	—			5.879	5.798		5.489	5.414
$\bar{B}^0\to\eta\rho^0$	0.002	0.010	0.037	0.004	0.014	0.042	$B^-\to\eta'\rho^-$	4.954	4.424	4.366	4.935	4.494	4.438
		0.010	0.037		0.014	0.042			4.424	4.367		4.494	4.438
$\bar{B}^0\to\eta'\rho^0$	0.009	0.019	0.040	0.007	0.016	0.030	$B^-\to K^0K^{*-}$	0.025	0.036	0.045	0.036	0.054	0.061
		0.019	0.040		0.016	0.030			0.036	0.047		0.054	0.063
$\bar{B}^0\to\eta\omega$	0.253	0.113	0.129	0.206	0.092	0.100	$B^-\to K^-K^{*0}$	0.141	0.20	0.211	0.204	0.274	0.311
		0.101	0.116		0.083	0.093			0.20	0.209		0.274	0.307

TABLE V. *CP*-averaged branching ratios (in units of 10^{-6}) of decays $B\to PV$ for $b\to s$ transitions with central values of various parameters. The results in columns 2–4 are calculated with $A=0.819$, $\lambda=0.2237$, $\bar{\rho}=0.218$, and $\bar{\eta}=0.316$, while the results in columns 5–7 are computed with $A=0.83$, $\lambda=0.222$, $\bar{\rho}=0.05$, and $\bar{\eta}=0.381$.

Decay modes	NF	QCDF		NF	QCDF		Decay modes	NF	QCDF		NF	QCDF	
	BR	BR^f	BR^{f+a}	BR	BR^f	BR^{f+a}		BR	BR^f	BR^{f+a}	BR	BR^f	BR^{f+a}
$\bar{B}^0\to K^-\rho^+$	1.485	1.848	2.008	1.081	1.321	1.501	$B^-\to\pi^-\bar{K}^{*0}$	2.583	3.497	3.814	2.531	3.433	3.731
		1.848	2.054		1.321	1.546			3.497	3.765		3.433	3.684
$\bar{B}^0\to\bar{K}^0\rho^0$	0.918	1.184	1.256	1.038	1.239	1.297	$B^-\to\pi^0K^{*-}$	1.852	2.317	2.489	3.067	3.543	3.667
		1.186	1.282		1.242	1.322			2.317	2.464		3.543	3.643
$\mathbf{\bar{B}^0\to\bar{K}^0\omega}$	0.034	**0.083**	**0.007**	0.026	**0.076**	**0.012**	$B^-\to\eta K^{*-}$	1.777	2.247	2.591	2.564	3.022	3.306
		0.214	**0.289**		**0.182**	**0.266**			2.247	2.604		3.022	3.318
$\mathbf{\bar{B}^0\to\bar{K}^0\phi}$	3.663	**5.945**	**6.703**	3.589	**5.833**	**6.569**	$B^-\to\eta' K^{*-}$	1.446	2.664	2.83	1.046	2.091	2.277
		4.156	**4.629**		**4.081**	**4.537**			2.664	2.89		2.091	2.341
$\bar{B}^0\to\pi^+K^{*-}$	1.838	2.411	2.743	3.281	4.077	4.36	$B^-\to\bar{K}^0\rho^-$	0.403	0.598	0.789	0.395	0.585	0.777
		2.411	2.692		4.077	4.31			0.598	0.831		0.585	0.818
$\bar{B}^0\to\pi^0\bar{K}^{*0}$	0.533	0.744	0.896	0.459	0.714	0.875	$B^-\to K^-\rho^0$	0.453	0.426	0.528	0.609	0.503	0.631
		0.744	0.871		0.714	0.850			0.425	0.548		0.503	0.651
$\bar{B}^0\to\eta\bar{K}^{*0}$	2.072	2.681	2.972	2.15	2.67	2.927	$\mathbf{B^-\to K^-\omega}$	0.583	**0.530**	**0.435**	0.580	**0.565**	**0.495**
		2.681	2.985		2.67	2.940			**0.939**	**1.002**		**0.699**	**0.787**
$\bar{B}^0\to\eta'\bar{K}^{*0}$	0.759	1.717	1.891	0.689	1.662	1.84	$\mathbf{B^-\to K^-\phi}$	3.911	**6.346**	**7.179**	3.831	**6.227**	**7.02**
		1.717	1.959		1.662	1.91			**4.437**	**4.973**		**4.356**	**4.86**

TABLE VI. *CP*-violating asymmetry parameters $a_{\epsilon'}$ and $a_{\epsilon+\epsilon'}$ (in units of 10^{-2}) for decays $\bar{B}^0\to PV$ with central values of various parameters within the QCDF framework. The results in columns 2–5 are calculated with $A=0.819$, $\lambda=0.2237$, $\bar{\rho}=0.218$, and $\bar{\eta}=0.316$, while the results in columns 6–9 are calculated with $A=0.83$, $\lambda=0.222$, $\bar{\rho}=0.05$, and $\bar{\eta}=0.381$.

Modes	$a^f_{\epsilon'}$	$a^{f+a}_{\epsilon'}$	$a^f_{\epsilon+\epsilon'}$	$a^{f+a}_{\epsilon+\epsilon'}$	$a^f_{\epsilon'}$	$a^{f+a}_{\epsilon'}$	$a^f_{\epsilon+\epsilon'}$	$a^{f+a}_{\epsilon+\epsilon'}$
$\pi^0\rho^0$	−11.11	−6.90	48.29	51.66	−14.01	−8.88	−39.15	−34.80
	−11.05	−4.58	48.32	49.30	−13.93	−5.81	−39.11	−38.15
$\pi^0\omega$	19.08	80.95	94.80	**32.56**	28.82	80.02	**95.35**	10.70
	13.77	83.90	97.23	**54.40**	22.76	99.03	**77.28**	13.52
$\eta\rho^0$	31.78	16.77	−17.31	10.53	28.11	17.11	−87.88	−75.06
	31.73	20.63	−17.10	15.10	28.09	21.55	−87.81	−71.47
$\eta'\rho^0$	−28.02	−34.78	89.23	92.18	−39.96	−54.92	88.09	66.99
	−28.01	−31.80	89.20	93.53	−39.93	−50.65	88.08	70.85
$\eta\omega$	**44.82**	**29.66**	**74.53**	**81.05**	**64.64**	**45.06**	**16.02**	**26.05**
	27.34	**13.05**	**69.82**	**73.18**	**38.98**	**19.11**	**−1.07**	**3.39**
$\eta'\omega$	**−20.57**	**−16.88**	**32.27**	**26.95**	**−23.60**	**−18.81**	**−56.70**	**−62.16**
	−45.43	**−39.80**	**17.79**	**8.32**	**−47.68**	**−39.87**	**−64.81**	**−73.07**
$K^0_S\rho^0$	−5.56	−8.92	64.39	66.25	−6.27	−10.20	62.38	64.40
	−5.56	−9.08	64.40	66.49	−6.27	−10.40	62.39	64.68
$\mathbf{K^0_S\omega}$	**−41.77**	**86.90**	**79.28**	**−48.78**	**−54.10**	**62.18**	**73.15**	**−61.69**
	8.51	**21.86**	**89.46**	**80.11**	**11.85**	**28.00**	**92.38**	**79.58**
$K^0_S\phi$	−0.99	−0.97	73.24	73.40	−1.19	−1.17	72.91	73.11
	−1.16	−1.16	73.16	73.37	−1.40	−1.40	72.81	73.07
$\pi^0\phi$	0	—	2.29	—	0	—	1.83	—
	0	—	2.29	—	0	—	1.83	—
$\eta^{(\prime)}\phi$	0	0	2.29	2.29	0	0	1.83	1.83
	0	0	2.29	2.29	0	0	1.83	1.83

TABLE VII. *CP*-violating asymmetries $\mathcal{A}_{CP}$ (%) for $B\to PV$ ($b\to d$ transitions) with central values of various parameters within the QCDF approach. The results in the second and third columns are calculated with $A=0.819$, $\lambda=0.2237$, $\bar{\rho}=0.218$, and $\bar{\eta}=0.316$, while the results in the fourth and fifth columns are computed with $A=0.83$, $\lambda=0.222$, $\bar{\rho}=0.05$, and $\bar{\eta}=0.381$.

Modes	$\mathcal{A}_{CP}^{f}$	$\mathcal{A}_{CP}^{f+a}$	$\mathcal{A}_{CP}^{f}$	$\mathcal{A}_{CP}^{f+a}$
$B^0\to K_S^0\bar{K}^{*0}$	22.38	23.89	19.60	20.37
	22.38	23.66	19.60	20.20
$B^0\to K_S^0 K^{*0}$	−11.34	−11.97	−9.14	−9.36
	−11.34	−12.04	−9.14	−9.40
$B^0\to K^{\pm}K^{*\mp}$	—	17.41	—	−25.49
	—	17.41	—	−25.49
$B^0\to\pi^-\rho^+$	17.09	20.16	−13.47	−9.60
	17.09	19.94	−13.47	−9.88
$B^0\to\pi^+\rho^-$	25.64	21.51	−26.91	−31.85
	25.64	21.30	−26.91	−32.09
$\bar{B}^0\to\pi^0\rho^0$	15.75	20.10	−27.78	−22.36
	15.80	20.49	−27.71	−21.96
$\bar{\mathbf{B}}^{\mathbf{0}}\to\pi^0\omega$	57.59	**68.32**	**64.21**	**57.29**
	55.29	**80.64**	**51.65**	**71.04**
$\bar{B}^0\to\eta\rho^0$	12.49	15.95	−23.52	−24.58
	12.55	20.65	−23.49	−19.98
$\bar{B}^0\to\eta'\rho^0$	24.21	21.21	15.88	**−3.92**
	24.21	23.80	15.90	**0.69**
$\bar{\mathbf{B}}^{\mathbf{0}}\to\eta\omega$	**64.74**	**57.95**	**49.80**	**41.81**
	51.08	**43.36**	**24.92**	**14.08**
$\bar{\mathbf{B}}^{\mathbf{0}}\to\eta'\omega$	**1.95**	**1.83**	**−42.40**	**−41.88**
	−21.16	**−21.99**	**−61.97**	**−60.81**
$\bar{B}^0\to\pi^0\phi$	1.09	—	0.87	—
	1.09	—	0.87	—
$\bar{B}^0\to\eta^{(\prime)}\phi$	1.09	1.09	0.87	0.87
	1.09	1.09	0.87	0.87
$B^-\to\pi^-\rho^0$	3.26	12.47	3.58	13.76
	3.25	12.46	3.57	13.75
$\mathbf{B}^-\to\pi^-\omega$	**−6.22**	**−6.64**	**−8.18**	**−8.73**
	−3.31	**−3.07**	**−4.26**	**−3.94**
$B^-\to\pi^-\phi$	0	—	0	—
	0	—	0	—
$B^-\to\pi^0\rho^-$	−2.98	−9.09	−4.0	−12.14
	−2.98	−9.09	−4.0	−12.14
$B^-\to\eta\rho^-$	−1.75	−2.05	−2.21	−2.59
	−1.75	−1.46	−2.21	−1.84
$B^-\to\eta'\rho^-$	5.03	4.94	5.85	5.74
	5.03	5.51	5.85	6.40
$B^-\to K_S^0 K^{*-}$	−8.82	8.94	−6.94	7.83
	−8.82	8.31	−6.94	7.28
$B^-\to K^-K^{*0}$	−25.28	−33.23	−21.78	−26.58
	−25.28	−33.51	−21.78	−26.87

TABLE VIII. *CP*-violating asymmetries $\mathcal{A}_{CP}$ (%) for $B\to PV$ ($b\to s$ transitions) with central values of various parameters within the QCDF approach. The results in the fourth and fifth columns are calculated with $A=0.819$, $\lambda=0.2237$, $\bar{\rho}=0.218$, and $\bar{\eta}=0.316$, while the results in the fourth and fifth columns are computed with $A=0.83$, $\lambda=0.222$, $\bar{\rho}=0.05$, and $\bar{\eta}=0.381$.

Modes	$\mathcal{A}_{CP}^{f}$	$\mathcal{A}_{CP}^{f+a}$	$\mathcal{A}_{CP}^{f}$	$\mathcal{A}_{CP}^{f+a}$
$\bar{B}^0\to K^-\rho^+$	1.62	−34.31	2.68	−54.21
	1.62	−36.64	2.68	−57.51
$\bar{B}^0\to K_S^0\rho^0$	27.04	25.73	25.62	24.01
	27.04	25.74	25.62	24.01
$\bar{\mathbf{B}}^{\mathbf{0}}\to\mathbf{K}_{\mathbf{S}}^{\mathbf{0}}\boldsymbol{\omega}$	**10.51**	**33.46**	**−0.46**	**11.19**
	48.15	**52.42**	**51.72**	**56.16**
$\bar{B}^0\to K_S^0\phi$	34.23	34.32	33.95	34.05
	34.08	34.18	33.76	33.88
$\bar{B}^0\to\pi^+K^{*-}$	20.57	47.0	14.36	34.92
	20.57	45.5	14.36	33.51
$\bar{B}^0\to\pi^0\bar{K}^{*0}$	−9.49	−9.51	−11.69	−11.50
	−9.49	−9.62	−11.69	−11.65
$\bar{B}^0\to\eta\bar{K}^{*0}$	5.05	5.52	5.99	6.61
	5.05	5.51	5.99	6.60
$\bar{B}^0\to\eta'\bar{K}^{*0}$	−5.51	−5.56	−6.72	−6.75
	−5.51	−5.51	−6.72	−6.68
$B^-\to\pi^-\bar{K}^{*0}$	0.97	1.23	1.17	1.49
	0.97	1.24	1.17	1.50
$B^-\to\pi^0K^{*-}$	18.86	35.57	14.56	28.51
	18.86	34.64	14.56	27.66
$B^-\to\eta K^{*-}$	7.73	29.28	6.79	27.09
	7.73	29.45	6.79	27.28
$B^-\to\eta'K^{*-}$	−13.78	−20.39	−20.73	−29.92
	−13.78	−21.39	−20.73	−31.21
$B^-\to K_S^0\rho^-$	0.31	−0.34	0.38	−0.41
	0.31	−0.31	0.38	−0.37
$B^-\to K^-\rho^0$	2.88	−80.25	2.87	−79.31
	3.06	−83.34	3.05	−82.71
$\mathbf{B}^-\to\mathbf{K}^-\boldsymbol{\omega}$	**59.85**	**−19.92**	**66.26**	**−20.63**
	1.36	**−42.21**	**2.16**	**−63.47**
$B^-\to K^-\phi$	0.99	1.17	1.19	1.41
	1.16	1.41	1.40	1.71

should read

$$A_3^i(V,P) \simeq \pi\alpha_s r_\chi [2\pi^2 + 6(X_A^2 - 2X_A)], \tag{2.14b}$$

We replace the minus sign in front of X_A^2 term on the right-hand side.

Because A_3^i is always multiplied by the small Wilson coefficients C_5 and C_7, the change of the formula (2.14b) will not affect the numerical results greatly, while the change of the formula (2.9b) only affects the results of those decay modes which involve the hard spectator scattering in $B \to P$ transitions, such as $\bar{B}^0 \to \bar{K}^0\phi$, $\bar{K}^0\omega$, $B^- \to K^-\phi$, $K^-\omega$, and so on. But the main conclusions still hold. Now we list the updated results as follows. (For comparison, the previous and updated values in Tables IV–VIII are both shown in the upper and lower entries, respectively. We underline the decay modes with large changes.)