Supplemental material

BESIII Collaboration

TABLE I. The magenitude (ρ) for different resonant contributions, uncertainties are statistical only.

Component	ρ
$D_s^+[P] \to K^*(892)^+\overline{K}^*(892)^0$	0.36 ± 0.03
$D_s^+[D] \to K^*(892)^+\overline{K}^*(892)^0$	0.47 ± 0.04
$D_s^+ \to \eta(1475)\pi^+, \eta(1475) \to \overline{K}^*(892)^0 K_S^0$ and $\eta(1475) \to \overline{K}^*(892)^0 K_S^0$	1.03 ± 0.16
$D_s^+ \to \overline{K}^*(892)^0 (K_S^0\pi^+)_{S\text{-wave}}$	1.89 ± 0.25
$D_s^+ \to \eta(1475)\pi^+, \eta(1475) \to (K_S^0\pi^+)_{S\text{-wave}} K^-$	4.32 ± 0.40
$D_s^+ \to \eta(1475)\pi^+, \eta(1475) \to a_0(980)^-\pi^+$	1.36 ± 0.18
$D_s^+ \to f_1(1285)\pi^+, f_1(1285) \to a_0(980)^-\pi^+$	1.79 ± 0.23
$D_s^+ \to \overline{K}^*(892)^0 (K_S^0\pi^+)_{S\text{-wave}}$	2.19 ± 0.20
$D_s^+ \to (K^*(892)^+K^-)_P\pi^+$, $(K^*(892)^+K^-)_P \to K^*(892)^+K^-$	4.32 ± 0.52

TABLE II. Correlation matrix. (I)$D_s^+[P] \to K^*(892)^+\overline{K}^*(892)^0$, (II)$D_s^+[D] \to K^*(892)^+\overline{K}^*(892)^0$, (III)$D_s^+ \to \eta(1475)\pi^+, \eta(1475) \to \overline{K}^*(892)^0 K_S^0$ and $\eta(1475) \to \overline{K}^*(892)^0 K_S^0$, (IV)$D_s^+ \to \overline{K}^*(892)^0 (K_S^0\pi^+)_{S\text{-wave}}$, (V)$D_s^+ \to \eta(1475)\pi^+, \eta(1475) \to (K_S^0\pi^+)_{S\text{-wave}} K^-$, (VI)$D_s^+ \to \eta(1475)\pi^+, \eta(1475) \to a_0(980)^-\pi^+$, (VII)$D_s^+ \to f_1(1285)\pi^+, f_1(1285) \to a_0(980)^-\pi^+$, (VIII)$D_s^+ \to \overline{K}^*(892)^0 (K_S^0\pi^+)_{S\text{-wave}}$, (IX)$D_s^+ \to (K^*(892)^+K^-)_P\pi^+, (K^*(892)^+K^-)_P \to K^*(892)^+K^-$.

		I		II		III		IV		V		VI		VII		VIII		IX	
		ϕ	ρ	ϕ	ρ	ϕ	ρ	ϕ	ρ	ϕ	ρ	ϕ	ρ	ϕ	ρ	ϕ	ρ	ϕ	ρ
I	ϕ	1.00	0.15	0.34	-0.16	-0.03	0.17	0.02	0.12	0.04	0.01	0.04	0.04	0.14	0.12	0.33	0.03	0.21	0.10
	ρ		1.00	-0.02	0.05	0.01	0.31	0.17	0.32	0.06	0.33	0.03	0.21	0.03	0.22	0.05	0.31	-0.15	0.47
II	ϕ			1.00	-0.31	-0.24	0.11	-0.08	0.17	-0.24	-0.17	-0.23	-0.02	0.19	0.21	0.32	-0.12	0.02	0.03
	ρ				1.00	0.22	-0.15	0.40	0.06	0.19	0.09	0.19	-0.02	0.04	0.03	-0.10	0.03	-0.13	0.21
III	ϕ					1.00	-0.24	0.33	0.11	0.47	-0.21	0.44	-0.37	0.14	-0.18	0.27	0.09	0.12	-0.13
	ρ						1.00	-0.28	0.60	-0.02	0.58	0.13	0.50	-0.21	0.14	-0.10	0.59	-0.30	0.30
IV	ϕ							1.00	0.11	0.38	-0.05	0.28	-0.17	0.30	0.10	0.15	0.05	-0.13	0.50
	ρ								1.00	-0.06	0.30	0.07	0.28	0.01	0.16	0.13	0.46	-0.53	0.34
V	ϕ									1.00	0.07	0.80	-0.23	0.04	-0.09	0.07	-0.04	0.19	0.15
	ρ										1.00	0.18	0.81	-0.22	0.15	-0.13	0.41	-0.23	0.40
VI	ϕ											1.00	-0.07	0.03	-0.07	0.11	0.04	0.11	0.11
	ρ												1.00	-0.13	0.15	-0.12	0.30	-0.19	0.23
VII	ϕ													1.00	0.19	0.32	-0.11	0.07	0.05
	ρ														1.00	0.15	0.05	-0.15	0.23
VIII	ϕ															1.00	-0.13	0.14	0.01
	ρ																1.00	-0.29	0.38
IX	ϕ																	1.00	-0.37
	ρ																		1.00