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Amplitude analysis of $D^0 \to K_S^0 \pi^+ \pi^- \pi^0$

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Abstract

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1 Amplitude Analysis

Table 1: Amplitudes.

Component	Amplitude
$D^0 \to K^{*-}\rho^+$	$D^0[S] \to K^{*-}\rho^+$
	$D^0[P] \to K^{*-}\rho^+$
	$D^0[D] \to K^{*-}\rho^+$
$D^0 \to \bar{K}^{*0}\rho^0$	$D^0[S] \to \bar{K}^{*0}\rho^0$
	$D^0[P] \to \bar{K}^{*0}\rho^0$
	$D^0[D] \to \bar{K}^{*0}\rho^0$
$D^0 \to K_1^-(1270)\pi^+$	$D^0 \to K_1^-(1270)\pi^+,\ K_1^-(1270)[S] \to K^{*-}\pi^0$
	$D^0 \to K_1^-(1270)\pi^+,\ K_1^-(1270)[D] \to K^{*-}\pi^0$
	$D^0 \to K_1^-(1270)\pi^+,\ K_1^-(1270)[S] \to \bar{K}^{*0}\pi^-$
	$D^0 \to K_1^-(1270)\pi^+,\ K_1^-(1270)[D] \to \bar{K}^{*0}\pi^-$
	$D^0 \to K_1^-(1270)\pi^+,\ K_1^-(1270)[S] \to \bar{K}^0\rho^-$
	$D^0 \to K_1^-(1270)\pi^+,\ K_1^-(1270)[D] \to \bar{K}^0\rho^-$
$D^0 \to \bar{K}_1^0(1270)\pi^0$	$D^0 \to \bar{K}_1^0(1270)\pi^0,\ \bar{K}_1^0(1270)[S] \to K^{*-}\pi^+$
	$D^0 \to \bar{K}_1^0(1270)\pi^0,\ \bar{K}_1^0(1270)[D] \to K^{*-}\pi^+$
	$D^0 \to \bar{K}_1^0(1270)\pi^0,\ \bar{K}_1^0(1270)[S] \to \bar{K}^0\rho^0$
	$D^0 \to \bar{K}_1^0(1270)\pi^0,\ \bar{K}_1^0(1270)[D] \to \bar{K}^0\rho^0$
$D^0 \to \bar{K}^0 a_1^0(1260)$	$D^0 \to \bar{K}^0 a_1^0(1260),\ a_1^0(1260)[S] \to \rho^+\pi^-$
	$D^0 \to \bar{K}^0 a_1^0(1260),\ a_1^0(1260)[D] \to \rho^+\pi^-$
	$D^0 \to \bar{K}^0 a_1^0(1260),\ a_1^0(1260)[S] \to \rho^-\pi^+$
	$D^0 \to \bar{K}^0 a_1^0(1260),\ a_1^0(1260)[D] \to \rho^-\pi^+$
	$D^0 \to \bar{K}^0 a_1^0(1260),\ a_1^0(1260)[S] \to \rho^0\pi^0$
	$D^0 \to \bar{K}^0 a_1^0(1260),\ `a_1^0(1260)[D] \to \rho^0\pi^0$
$D^0 \to K^{*-}\pi^+\pi^0$	$D^0 \to (K^{*-}\pi^+)_P\pi^0$
	$D^0 \to (K^{*-}\pi^+)_V\pi^0$
	$D^0 \to (K^{*-}\pi^+)_A\pi^0,\ (K^{*-}\pi^+)_A[S] \to K^{*-}\pi^+$
	$D^0 \to (K^{*-}\pi^+)_A\pi^0,\ (K^{*-}\pi^+)_A[D] \to K^{*-}\pi^+$
	$D^0 \to (K^{*-}\pi^+)_T\pi^0,\ (K^{*-}\pi^+)_T[P] \to K^{*-}\pi^+$
	$D^0 \to (K^{*-}\pi^+)_T\pi^0,\ (K^{*-}\pi^+)_T[D] \to K^{*-}\pi^+$
	$D^0 \to (K^{*-}\pi^0)_P\pi^+$
	$D^0 \to (K^{*-}\pi^0)_V\pi^+$
	$D^0 \to (K^{*-}\pi^0)_A\pi^+,\ (K^{*-}\pi^0)_A[S] \to K^{*-}\pi^0$
	$D^0 \to (K^{*-}\pi^0)_A\pi^+,\ (K^{*-}\pi^0)_A[D] \to K^{*-}\pi^0$
	$D^0 \to (K^{*-}\pi^0)_T\pi^+,\ (K^{*-}\pi^0)_T[P] \to K^{*-}\pi^0$
	$D^0 \to (K^{*-}\pi^0)_T\pi^+,\ (K^{*-}\pi^0)_T[D] \to K^{*-}\pi^0$
	$D^0 \to K^{*-}(\pi^+\pi^0)_S$
	$D^0[S] \to K^{*-}(\pi^+\pi^0)_V$
	$D^0[P] \to K^{*-}(\pi^+\pi^0)_V$
	$D^0[D] \to K^{*-}(\pi^+\pi^0)_V$
	$D^0 \to K^{*-}(\pi^+\pi^0)_T$
$D^0 \to \bar{K}^{*0}\pi^+\pi^-$	$D^0 \to (\bar{K}^{*0}\pi^-)_P\pi^+$
	$D^0 \to (\bar{K}^{*0}\pi^-)_V\pi^+$
	$D^0 \to (\bar{K}^{*0}\pi^-)_A\pi^+,\ (\bar{K}^{*0}\pi^-)_A[S] \to \bar{K}^{*0}\pi^-$
	$D^0 \to (\bar{K}^{*0}\pi^-)_A\pi^+,\ (\bar{K}^{*0}\pi^-)_A[D] \to \bar{K}^{*0}\pi^-$
	$D^0 \to (\bar{K}^{*0}\pi^-)_T\pi^+,\ (\bar{K}^{*0}\pi^-)_T[P] \to \bar{K}^{*0}\pi^-$
	$D^0 \to (\bar{K}^{*0}\pi^-)_T\pi^+,\ (\bar{K}^{*0}\pi^-)_T[D] \to \bar{K}^{*0}\pi^-$
	$D^0 \to \bar{K}^{*0}(\pi^+\pi^+)_S$
	$D^0[S] \to \bar{K}^{*0}(\pi^-\pi^+)_V$
	$D^0[P] \to \bar{K}^{*0}(\pi^-\pi^+)_V$
	$D^0[D] \to \bar{K}^{*0}(\pi^-\pi^+)_V$
	$D^0 \to \bar{K}^{*0}(\pi^-\pi^+)_T$
$D^0 \to \bar{K}^0\pi^-\rho^+$	$D^0 \to (\pi^-\rho^+)_P\bar{K}^0$
	$D^0 \to (\pi^-\rho^+)_V\bar{K}^0$
	$D^0 \to (\pi^-\rho^+)_A\bar{K}^0,\ (\pi^-\rho^+)_A[S] \to \pi^-\rho^+$
	$D^0 \to (\pi^-\rho^+)_A\bar{K}^0,\ (\pi^-\rho^+)_A[D] \to \pi^-\rho^+$
	$D^0 \to (\pi^-\rho^+)_T\bar{K}^0,\ (\pi^-\rho^+)_T[P] \to \pi^-\rho^+$
	$D^0 \to (\pi^-\rho^+)_T\bar{K}^0,\ (\pi^-\rho^+)_T[D] \to \pi^-\rho^+$
	$D^0 \to (\bar{K}^0\pi^-)_S\rho^+$
	$D^0 \to (\bar{K}^0\pi^-)_V\rho^+,\ (\bar{K}^0\pi^-)_V[S] \to \bar{K}^0\pi^-$
	$D^0 \to (\bar{K}^0\pi^-)_V\rho^+,\ (\bar{K}^0\pi^-)_V[P] \to \bar{K}^0\pi^-$
	$D^0 \to (\bar{K}^0\pi^-)_V\rho^+,\ (\bar{K}^0\pi^-)_V[D] \to \bar{K}^0\pi^-$
	$D^0 \to (\bar{K}^0\pi^-)_T$

Table 2: Amplitudes.

Component	Amplitude
$D^0 \to \bar{K}^0\pi^0\rho^0$	$D^0 \to (\bar{K}^0\rho^0)_P\pi^0$
	$D^0 \to (\bar{K}^0\rho^0)_V\pi^0$
	$D^0 \to (\bar{K}^0\rho^0)_A\pi^0,\ (\bar{K}^0\rho^0)_A[S] \to \bar{K}^0\rho^0$
	$D^0 \to (\bar{K}^0\rho^0)_A\pi^0,\ (\bar{K}^0\rho^0)_A[D] \to \bar{K}^0\rho^0$
	$D^0 \to (\bar{K}^0\rho^0)_T\pi^0,\ (\bar{K}^0\rho^0)_T[P] \to \bar{K}^0\rho^0$
	$D^0 \to (\bar{K}^0\rho^0)_T\pi^0,\ (\bar{K}^0\rho^0)_T[D] \to \bar{K}^0\rho^0$
	$D^0 \to (\pi^0\rho^0)_P\bar{K}^0$
	$D^0 \to (\pi^0\rho^0)_V\bar{K}^0$
	$D^0 \to (\pi^0\rho^0)_A\bar{K}^0,\ (\pi^0\rho^0)_A[S] \to \pi^0\rho^0$
	$D^0 \to (\pi^0\rho^0)_A\bar{K}^0,\ (\pi^0\rho^0)_A[D] \to \pi^0\rho^0$
	$D^0 \to (\pi^0\rho^0)_T\bar{K}^0,\ (\pi^0\rho^0)_T[P] \to \pi^0\rho^0$
	$D^0 \to (\pi^0\rho^0)_T\bar{K}^0,\ (\pi^0\rho^0)_T[D] \to \pi^0\rho^0$
	$D^0 \to (\to \bar{K}^0\pi^0)_S\rho^0,\ (\bar{K}^0\pi^0)_S \to \bar{K}^0\pi^0$
	$D^0 \to (\to \bar{K}^0\pi^0)_V\rho^0,\ (\bar{K}^0\pi^0)_V[S] \to \bar{K}^0\pi^0$
	$D^0 \to (\to \bar{K}^0\pi^0)_V\rho^0,\ (\bar{K}^0\pi^0)_V[P] \to \bar{K}^0\pi^0$
	$D^0 \to (\to \bar{K}^0\pi^0)_V\rho^0,\ (\bar{K}^0\pi^0)_V[D] \to \bar{K}^0\pi^0$
	$D^0 \to (\to \bar{K}^0\pi^0)_T\rho^0,\ (\bar{K}^0\pi^0)_T \to \bar{K}^0\pi^0$

Appendices