

Supplemental: First Observation of $D^+ \rightarrow \eta\mu^+\nu_\mu$ and Measurement of its Decay Dynamics

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Table 1 shows the tag dependent ST yields in data, ST efficiencies, DT efficiencies, and signal efficiencies of $D^+ \rightarrow \eta\mu^+\nu_\mu$. Table 2 shows the efficiency matrix of $D^+ \rightarrow \eta\mu^+\nu_\mu$ across different q^2 intervals averaged over six tag modes.

Table 1. Tag dependent ST yields in data, ST efficiencies, DT efficiencies and signal efficiencies of $D^+ \rightarrow \eta\mu^+\nu_\mu$. The efficiencies do not include the BFs of K_S^0 , π^0 , and η . The uncertainties are statistical only.

ST mode	N_{ST}	ϵ_{ST} (%)	ϵ_{DT} (%)	$\epsilon_{\eta\mu\nu} = \epsilon_{\text{DT}}/\epsilon_{\text{ST}}$ (%)
$K^+\pi^-\pi^-$	782669 ± 990	50.57 ± 0.06	19.00 ± 0.09	37.23 ± 0.18
$K^+\pi^-\pi^-\pi^0$	251008 ± 1135	26.72 ± 0.09	9.71 ± 0.08	36.02 ± 0.33
$K_S^0\pi^-$	91345 ± 320	50.39 ± 0.17	20.56 ± 0.11	40.44 ± 0.25
$K_S^0\pi^-\pi^0$	215364 ± 1238	27.25 ± 0.07	11.41 ± 0.12	41.49 ± 0.45
$K_S^0\pi^+\pi^-\pi^-$	113054 ± 889	28.29 ± 0.12	10.15 ± 0.18	35.54 ± 0.64
$K^+K^-\pi^-$	69034 ± 460	40.87 ± 0.24	13.66 ± 0.10	33.13 ± 0.32

Table 2. Efficiency matrix of $D^+ \rightarrow \eta\mu^+\nu_\mu$ across different q^2 intervals.

ϵ_{ij}	1	2	3	4	5
1	34.99	1.10	0.01	0.00	0.00
2	1.19	34.40	1.66	0.00	0.00
3	0.03	1.53	34.78	2.12	0.01
4	0.02	0.04	1.67	34.49	1.58
5	0.02	0.04	0.07	1.86	36.53