### $\Gamma(K^- e^+ \nu_e)/\Gamma(K^- \pi^+)$ $\Gamma_8/\Gamma_{21}$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.95 ±0.04 OUR FIT** | | | | | |
| **0.95 ±0.04 OUR AVERAGE** | | | | | |
| 0.978±0.027±0.044 | 2510 | [15] BEAN | 93C | CLEO | $e^+e^- \approx \Upsilon(4S)$ |
| 0.90 ±0.06 ±0.06 | 584 | CRAWFORD | 91B | CLEO | $e^+e^- \approx$ 10.5 GeV |
| 0.91 ±0.07 ±0.11 | | ANJOS | 89F | E691 | Photoproduction |

[15] BEAN 93C uses $K^- \mu^+ \nu_\mu$ as well as $K^- e^+ \nu_e$ events and makes a small phase-space adjustment to the number of the $\mu^+$ events to use them as $e^+$ events.

### $\Gamma(K^- \mu^+ \nu_\mu)/\Gamma(K^- \pi^+)$ $\Gamma_9/\Gamma_{21}$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.80±0.10 OUR FIT** | | | | | |
| **0.80±0.10 OUR AVERAGE** | | | | | |
| 0.82±0.13±0.13 | 99 | FRABETTI | 93I | E687 | $\gamma$ Be $\overline{E}_\gamma$ = 221 GeV |
| 0.79±0.08±0.09 | 231 | CRAWFORD | 91B | CLEO | $e^+e^- \approx$ 10.5 GeV |

### $\Gamma(K^- \mu^+ \nu_\mu)/\Gamma(\mu^+ \text{anything})$ $\Gamma_9/\Gamma_2$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.32±0.05±0.05** | 124 | KODAMA | 91 | EMUL | $p$A 800 GeV |

### $\Gamma(K^- \pi^0 e^+ \nu_e)/\Gamma_{\text{total}}$ $\Gamma_{10}/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| $\mathbf{0.016^{+0.013}_{-0.005}\pm0.002}$ | 4 | [16] BAI | 91 | MRK3 | $e^+e^- \approx$ 3.77 GeV |

[16] BAI 91 finds that a fraction $0.79^{+0.15}_{-0.17}{}^{+0.09}_{-0.03}$ of combined $D^+$ and $D^0$ decays to $\overline{K}\pi e^+ \nu_e$ (24 events) are $\overline{K}^*(892) e^+ \nu_e$.

### $\Gamma(\overline{K}^0 \pi^- e^+ \nu_e)/\Gamma_{\text{total}}$ $\Gamma_{11}/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| $\mathbf{0.028^{+0.017}_{-0.008}\pm0.003}$ | 6 | [17] BAI | 91 | MRK3 | $e^+e^- \approx$ 3.77 GeV |

[17] BAI 91 finds that a fraction $0.79^{+0.15}_{-0.17}{}^{+0.09}_{-0.03}$ of combined $D^+$ and $D^0$ decays to $\overline{K}\pi e^+ \nu_e$ (24 events) are $\overline{K}^*(892) e^+ \nu_e$.

### $\Gamma(K^*(892)^- e^+ \nu_e)/\Gamma(K^- e^+ \nu_e)$ $\Gamma_{20}/\Gamma_8$

Unseen decay modes of the $K^*(892)^-$ are included.

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **0.52±0.09 OUR FIT** | | | | |
| **0.51±0.18±0.06** | CRAWFORD | 91B | CLEO | $e^+e^- \approx$ 10.5 GeV |

### $\Gamma(K^*(892)^- e^+ \nu_e)/\Gamma(\overline{K}^0 \pi^+ \pi^-)$ $\Gamma_{20}/\Gamma_{23}$

Unseen decay modes of the $\overline{K}^*(892)^-$ are included.

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.38±0.06 OUR FIT** | | | | | |
| **0.38±0.06±0.03** | 152 | [18] BEAN | 93C | CLEO | $e^+e^- \approx \Upsilon(4S)$ |

[18] BEAN 93C uses $K^{*-} \mu^+ \nu_\mu$ as well as $K^{*-} e^+ \nu_e$ events and makes a small phase-space adjustment to the number of the $\mu^+$ events to use them as $e^+$ events.

### $\Gamma(K^*(892)^- \ell^+ \nu_\ell)/\Gamma(\overline{K}^0 \pi^+ \pi^-)$ $\Gamma_{13}/\Gamma_{23}$

This an average of the $K^*(892)^- e^+ \nu_e$ and $K^*(892)^- \mu^+ \nu_\mu$ ratios. Unseen decay modes of the $K^*(892)^-$ are included.

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 0.24±0.07±0.06 | 137 | [19] ALEXANDER | 90B | CLEO | $e^+e^-$ 10.5–11 GeV |

[19] ALEXANDER 90B cannot exclude extra $\pi^0$'s in the final state. See nearby data blocks for more detailed results.

### $\Gamma(K^- \pi^0 (\pi^0) e^+ \nu_e)/\Gamma_{\text{total}}$ $\Gamma_{14}/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $0.023^{+0.050}_{-0.006}\pm0.001$ | 1 | [20] AGUILAR-... | 87F | HYBR | $\pi p$, $pp$ 360, 400 GeV |

[20] AGUILAR-BENITEZ 87F computes the branching fraction using topological normalization. Does not distinguish presence of a second $\pi^0$.

### $\Gamma(\overline{K}^0 \pi^- (\pi^0) e^+ \nu_e)/\Gamma_{\text{total}}$ $\Gamma_{15}/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $0.079^{+0.069}_{-0.023}\pm0.005$ | 3 | [21] AGUILAR-... | 87F | HYBR | $\pi p$, $pp$ 360, 400 GeV |

[21] AGUILAR-BENITEZ 87F computes the branching fraction using topological normalization. Does not distinguish presence of a second $\pi^0$.

### $\Gamma(\overline{K}^*(892)^0 \pi^- e^+ \nu_e)/\Gamma(K^*(892)^- e^+ \nu_e)$ $\Gamma_{16}/\Gamma_{20}$

Unseen decay modes of the $\overline{K}^*(892)^0$ are included.

| VALUE | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **<0.64** | 90 | CRAWFORD | 91B | CLEO | $e^+e^- \approx$ 10.5 GeV |

### $\Gamma(K^- \pi^+ \pi^- \mu^+ \nu_\mu)/\Gamma(K^- \mu^+ \nu_\mu)$ $\Gamma_{17}/\Gamma_9$

| VALUE | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **<0.037** | 90 | KODAMA | 93B | E653 | $\pi^-$ emulsion 600 GeV |

### $\Gamma((\overline{K}^*(892)\pi)^- \mu^+ \nu_\mu)/\Gamma(K^- \mu^+ \nu_\mu)$ $\Gamma_{18}/\Gamma_9$

| VALUE | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **<0.043** | 90 | [22] KODAMA | 93B | E653 | $\pi^-$ emulsion 600 GeV |

[22] KODAMA 93B searched in $K^- \pi^+ \pi^- \mu^+ \nu_\mu$, but the limit includes other $(\overline{K}^*(892)\pi)^-$ charge states.

### $\Gamma(\pi^- e^+ \nu_e)/\Gamma_{\text{total}}$ $\Gamma_{19}/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| $\mathbf{0.0039^{+0.0023}_{-0.0011}\pm0.0004}$ | 7 | [23] ADLER | 89 | MRK3 | $e^+e^-$ 3.77 GeV |

[23] Experiment gives $|V_{cd}/V_{cs}|^2 = 0.057^{+0.038}_{-0.015} \pm 0.005$.

## Hadronic modes with one or three $K$'s

### $\Gamma(K^- \pi^+)/\Gamma_{\text{total}}$ $\Gamma_{21}/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.0401±0.0014 OUR FIT** | | | | | |
| **0.0397±0.0016 OUR AVERAGE** | | | | | |
| 0.045 ±0.006 ±0.004 | | ALBRECHT | 94 | ARG | $e^+e^- \approx \Upsilon(4S)$ |
| 0.0391±0.0008±0.0017 | 4208 | [24,25] AKERIB | 93 | CLEO | $e^+e^- \approx \Upsilon(4S)$ |
| 0.0362±0.0034±0.0044 | | [25] DECAMP | 91J | ALEP | From $Z$ decays |
| 0.045 ±0.008 ±0.005 | 56 | [25] ABACHI | 88 | HRS | $e^+e^-$ 29 GeV |
| 0.042 ±0.004 ±0.004 | 930 | ADLER | 88C | MRK3 | $e^+e^-$ 3.77 GeV |
| 0.041 ±0.006 | 263 | [26] SCHINDLER | 81 | MRK2 | $e^+e^-$ 3.771 GeV |
| 0.043 ±0.010 | 130 | [27] PERUZZI | 77 | MRK1 | $e^+e^-$ 3.77 GeV |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $0.0404^{+0.0040}_{-0.0035}$ | | [28] BARLAG | 92C | ACCM | $\pi^-$ Cu 230 GeV |
| $0.040^{+0.021}_{-0.010}$ ±0.002 | 7 | [28] AGUILAR-... | 87F | HYBR | $\pi p$, $pp$ 360, 400 GeV |

[24] Radiative corrections increase this AKERIB 93 value to 0.0395 ± 0.0008 ± 0.0017.
[25] ABACHI 88, DECAMP 91J, and AKERIB 93 use $D^*(2010)^+ \to D^0\pi^+$ decays. The $\pi^+$ is both slow and of low $p_T$ with respect to the event thrust axis ($\approx D^{*+}$ direction). The excess number of such $\pi^+$'s over background gives the number of $D^*(2010)^+ \to D^0\pi^+$ events, and the fraction with $D^0 \to K^-\pi^+$ gives the $D^0 \to K^-\pi^+$ branching fraction.
[26] SCHINDLER 81 (MARK-2) measures $\sigma(e^+e^- \to \psi(3770)) \times$ branching fraction to be 0.24 ± 0.02. We use the MARK-3 (ADLER 88C) value of $\sigma$ = 5.8 ± 0.5 ± 0.6 nb.
[27] PERUZZI 77 (MARK-1) measures $\sigma(e^+e^- \to \psi(3770)) \times$ branching fraction to be 0.25 ± 0.05. We use the MARK-3 (ADLER 88C) value of $\sigma$ = 5.8 ± 0.5 ± 0.6 nb.
[28] AGUILAR-BENITEZ 87F and BARLAG 92C compute the branching fraction using topological normalization.

### $\Gamma(\overline{K}^0 \pi^0)/\Gamma(K^- \pi^+)$ $\Gamma_{22}/\Gamma_{21}$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.51±0.06 OUR FIT** | Error includes scale factor of 1.1. | | | | |
| **1.36±0.23±0.22** | 119 | ANJOS | 92B | E691 | $\gamma$ Be 80–240 GeV |

### $\Gamma(\overline{K}^0 \pi^0)/\Gamma(\overline{K}^0 \pi^+ \pi^-)$ $\Gamma_{22}/\Gamma_{23}$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.389±0.031 OUR FIT** | | | | | |
| **0.378±0.033 OUR AVERAGE** | | | | | |
| 0.44 ±0.02 ±0.05 | 1942 | PROCARIO | 93B | CLEO | $e^+e^-$ 10.36–10.7 GeV |
| 0.34 ±0.04 ±0.02 | 92 | [29] ALBRECHT | 92P | ARG | $e^+e^- \approx$ 10 GeV |
| 0.36 ±0.04 ±0.08 | 104 | KINOSHITA | 91 | CLEO | $e^+e^- \sim$ 10.7 GeV |

[29] This value is calculated from numbers in Table 1 of ALBRECHT 92P.

### $\Gamma(\overline{K}^0 \pi^+ \pi^-)/\Gamma_{\text{total}}$ $\Gamma_{23}/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.053 ±0.006 OUR FIT** | Error includes scale factor of 1.2. | | | | |
| **0.063 ±0.009 OUR AVERAGE** | | | | | |
| 0.064 ±0.005 ±0.010 | | ADLER | 87 | MRK3 | $e^+e^-$ 3.77 GeV |
| 0.052 ±0.016 | 32 | [30] SCHINDLER | 81 | MRK2 | $e^+e^-$ 3.771 GeV |
| 0.079 ±0.023 | 28 | [31] PERUZZI | 77 | MRK1 | $e^+e^-$ 3.77 GeV |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $0.0427^{+0.0102}_{-0.0096}$ | | [32] BARLAG | 92C | ACCM | $\pi^-$ Cu 230 GeV |
| $0.045^{+0.059}_{-0.014}$ ±0.003 | 2 | [32] AGUILAR-... | 87F | HYBR | $\pi p$, $pp$ 360, 400 GeV |

[30] SCHINDLER 81 (MARK-2) measures $\sigma(e^+e^- \to \psi(3770)) \times$ branching fraction to be 0.30 ± 0.08. We use the MARK-3 (ADLER 88C) value of $\sigma$ = 5.8 ± 0.5 ± 0.6 nb.
[31] PERUZZI 77 (MARK-1) measures $\sigma(e^+e^- \to \psi(3770)) \times$ branching fraction to be 0.46 ± 0.12. We use the MARK-3 (ADLER 88C) value of $\sigma$ = 5.8 ± 0.5 ± 0.6 nb.
[32] AGUILAR-BENITEZ 87F and BARLAG 92C compute the branching fraction using topological normalization.

### $\Gamma(\overline{K}^0 \pi^+ \pi^-)/\Gamma(K^- \pi^+)$ $\Gamma_{23}/\Gamma_{21}$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **1.31±0.14 OUR FIT** | Error includes scale factor of 1.2. | | | | |
| **2.1 ±0.6 OUR AVERAGE** | | | | | |
| 1.7 ±0.8 | 35 | AVERY | 80 | SPEC | $\gamma N \to D^{*+}$ |
| 2.8 ±1.0 | 116 | PICCOLO | 77 | MRK1 | $e^+e^-$ 4.03, 4.41 GeV |