

$^{13}\text{C}(\pi^+, \pi^0)$

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, C. G. Sheu and J. E. Purcell		NDS 198,1 (2024)	1-Aug-2024

- [1976Sh01](#): $^{13}\text{C}(\pi^+, \pi^0)$ $E_{\pi^+}=70\text{-}250$ MeV; measured activation $\sigma(E)$.
[1980Ba27](#): $^{13}\text{C}(\pi^+, \pi^0)$ $E_{\pi^+}=98$ MeV; measured $\sigma_{\text{ave}}=0.43$ mb/sr 6 for $\theta=0^\circ$ to 16° .
[1980Bo03](#): $^{13}\text{C}(\pi^+, \pi^0)$ $E_{\pi^+}=200$ MeV; measured $\sigma(\theta)$ for $\theta=0^\circ$ to 50° . Overview of LAMPF facility.
[1982Do02](#): $^{13}\text{C}(\pi^+, \pi^0)$ $E_{\pi^+}=70\text{-}180$ MeV; measured $\sigma(\theta)$ for $\theta=0^\circ$ and 7° for $^{13}\text{N}_{\text{g.s.}}$. Listed $\sigma(E, \theta)$ table.
[1982Do10](#): $^{13}\text{C}(\pi^+, \pi^0)$ $E_{\pi^+}=164$ MeV; measured $\sigma(\theta)$ for $\theta=0^\circ$ to 60° for $^{13}\text{N}_{\text{g.s.}}$. Listed $\sigma(\theta)$ table.
[1988Us01](#): $^{13}\text{C}(\pi^+, \pi^0)$ $E_{\pi^+}=50\text{-}340$ MeV; measured $\sigma(E)$ for $^{13}\text{N}_{\text{g.s.}}$. Listed $\sigma(E)$ table.
[1990Go36, 1991Go14](#): $^{13}\text{C}(\pi^+, \pi^0)$ $E_{\pi^+}=163$ MeV; polarized ^{13}C target. Measured $\sigma(\theta)$ $A_y(\theta)$ for $\theta=20^\circ$ to 60° . Analyzed $^{13}\text{N}_{\text{g.s.}}$ and unresolved $^{13}\text{N}^*(3.5\text{ MeV}; 3/2^- \text{ \& } 5/2^+)$ doublet.
[1994Ha41](#): $^{13}\text{C}(\pi^+, \pi_0)$ $E=165$; measured $\sigma(\theta, E_\pi)$ for $\theta=0^\circ$ to 50° at LAMPF using the π^0 spectrometer to measure the decay $\gamma\text{-}\gamma$ photons. Analyzed π_0 to $^{13}\text{N}^*(0, 12.8\text{ MeV})$ $T=1/2$ states and $^{13}\text{N}^*(23.3\text{ MeV})$ $T=3/2$ state.

Theory:

Calculated $\sigma(E)$ or $\sigma(\theta)$: [1970Bj01](#): $E_{\pi^+}=180$ MeV; [1971Ka62](#): $E_{\pi^+}=180$ MeV; [1973Ch20](#): $E_{\pi^+}=180$ MeV; [1973Au06](#): $E_{\pi^+}=30\text{-}90$ MeV; [1974Ka07](#): $E_{\pi^+}=30\text{-}200$ MeV; [1976Ga06](#): $E_{\pi^+}=30\text{-}200$ MeV; [1976Ga21](#): analyzed $\sigma(E)$ in $\Delta_{(3,3)}$ resonance region; [1976Gi01](#): $E_{\pi^+}=20\text{-}240$ MeV; [1976Li04](#): $E_{\pi^+}=30\text{-}230$ MeV; [1976Ni05](#): $E_{\pi^+}=40\text{-}200$ MeV; [1976Os06](#): $E_{\pi^+}=150\text{-}250$ MeV; [1977Au01](#): $E_{\pi^+}=80\text{-}200$ MeV; [1977Fu10](#); [1977Lo19](#): $E_{\pi^+}=100\text{-}300$ MeV; [1977Wa02](#), [1978Wa02](#): $E_{\pi^+}=80\text{-}200$ MeV; [1979La22](#): $E_{\pi^+}=30\text{-}250$ MeV; [1979Sa21](#): $E_{\pi^+}=100\text{-}200$ MeV; [1980Ch08](#): $E_{\pi^+}=120\text{-}226$ MeV; [1980Ei01](#): $E_{\pi^+}=100\text{-}200$ MeV; [1980Ga12](#): $E_{\pi^+}=0\text{-}300$ MeV; [1980Le02](#): $E_{\pi^+}=80\text{-}240$ MeV; [1980Sa04](#): $E_{\pi^+}=100\text{-}200$ MeV; [1981Hi06](#): $E_{\pi^+}=70\text{-}230$ MeV; [1981Li02](#): $E_{\pi^+}=30\text{-}260$ MeV; [1981Os04](#): $E_{\pi^+}=130\text{-}250$ MeV; [1981Po10](#): $E_{\pi^+}=162$ MeV; [1983Ka19](#): $E_{\pi^+}=40\text{-}240$ MeV; [1990Gl09](#): $E_{\pi^+}=163$ MeV; [1991Ka18](#): $E_{\pi^+}=130\text{-}250$ MeV; [1996No03](#): $E_{\pi^+}=163$; [1999Ta33](#): $E_{\pi^+}=165$.

 ^{13}N Levels

E(level)	Γ	Comments
0		
3.5×10^3 †		
7.4×10^3 †		
12.8×10^3 ‡	7.9 ‡ MeV	$T=1/2$
23.3×10^3 ‡	10.4 ‡ MeV	$T=3/2$

† From [\(1991Go14\)](#).

‡ From [\(1994Ha41\)](#).