

FBS-Padova

Few-Body Systems (nuclear systems and applications)

CN Michele Viviani (Pisa) (Prima: L. Canton Padova x 10Y)

Lecce (L. Girlanda) FTE 1.0

Padova (L. Canton) FTE 0.9 (-> 0.1 nuova attività [Radiofarmaci](#))

Pisa (M. Viviani) FTE 5.0

TIFPA (G. Orlandini) FTE 4.0

TOTALE FTE 10.9

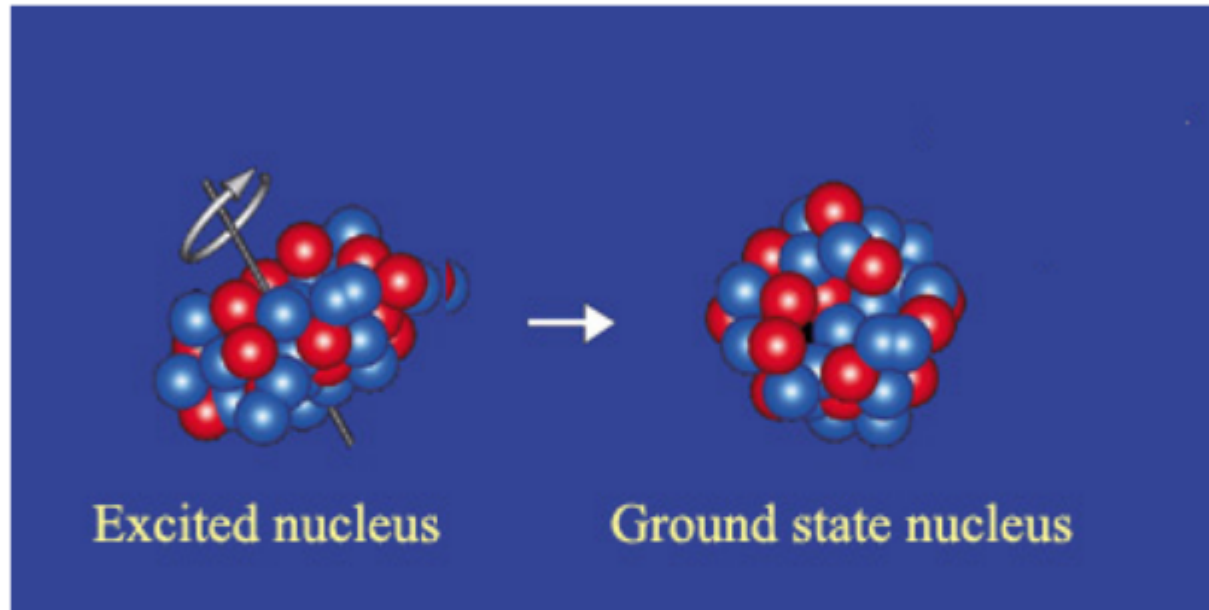
Attività FBS svolta da Padova

- Scattering n-d con equazioni di Faddeev
- Applicazioni: Nuclear Data per reattori heavy-water. Nuclear Data Sheets (IRMM Geel, AECL)
- Studio reazioni $pd \leftrightarrow He-3 \pi^0$ alle energie intermedie. Dinamica 3N con eq. Faddeev. Analisi sezioni d'urto e osservabili di spin.
- Applicazioni: calcolo del fattore di forma adronico nei modelli RCQM ($N \rightarrow N_{pi}$, $\Delta \rightarrow N_{pi}$) (Univ GRAZ)
- Sviluppato modelli a cluster e CC per sistemi più complessi. $Li-7 \leftrightarrow H-3 + He-4$, $Be-7 \leftrightarrow He-3 + He-4$, $Be-8 \leftrightarrow He-4 + He-4$, and $Li-6 \leftrightarrow H-2 + He-4$, $Be-10 \leftrightarrow He-4 + He-6$
- Applicazioni di astrofisica nucleare e problema del litio primordiale (LNL,PD,LNGS).

Attività FBS svolta da Padova II

Metodi CC per lo scattering nucleare

COUPLED-CHANNEL dynamics: including the collective low-energy excitations of the core.



$C13$ ($n-C12$), $N13$ ($p-C12$), $C15$ ($n-C14$), $F15$ ($p-O14$), $He7$, $B7$,
 $Be7$, $Li7$, $Be9$, $B9$, $C17$ ($n-C16$), $Na-17$ ($p-Ne16$) $C-19$ ($n-C18$),
 ${}^9\Lambda Be$, ${}^{13}\Lambda C$,
and also ... $Ne23$ ($n-Ne22$), $Mn23$, $Na23$ ($p-Ne22$), $Al23$, $O17$
($n-O16$), $F17$ ($p-O16$), $O19$... $O16$ ($\alpha-C12$), $Be10$ ($\alpha-He6$)

Phys. Lett. (2016)

p-O16 inverse kinematics

An above-barrier narrow resonance in ^{15}F

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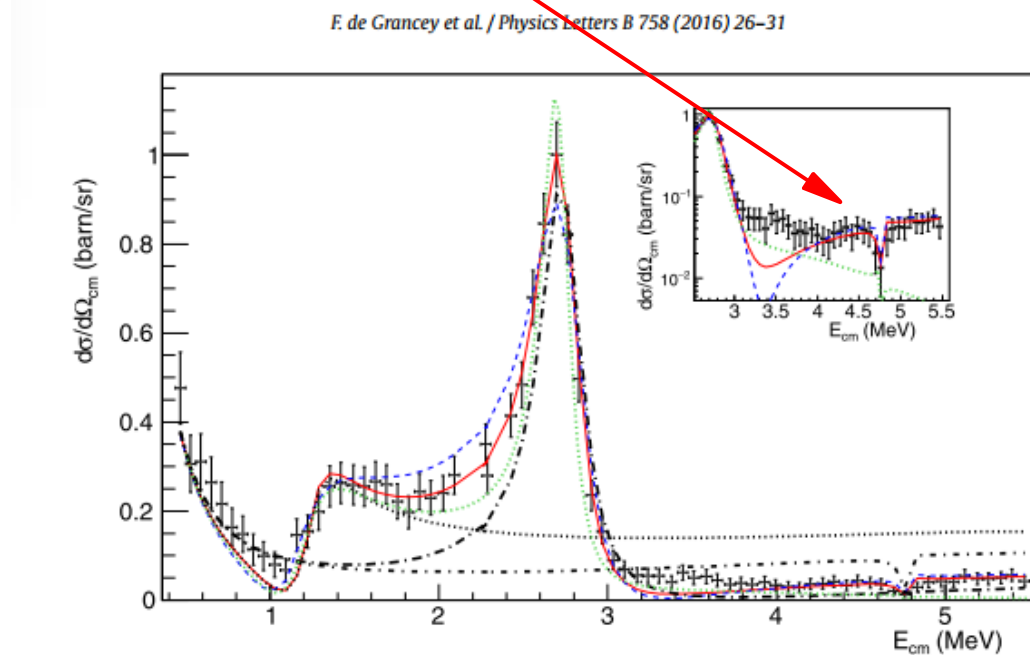
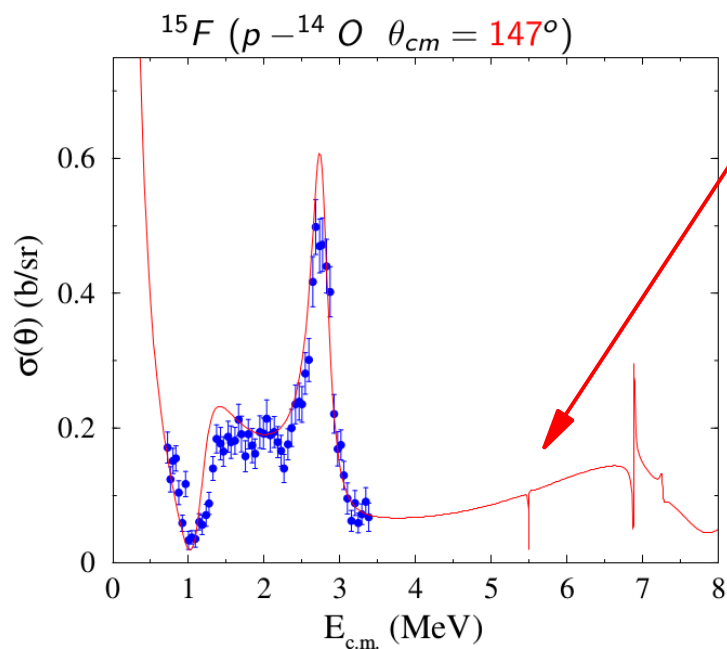
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Table 1

Resonance energy, width and spin measured and theoretical predictions for the second excited state of ^{15}F .

	Ref.	Second excited state		
		E_R (MeV)	Γ (keV)	J^π
Measured	[16]	4.800(100)	150(100)	—
	[31]	4.900(200)	200(200)	—
	Present	4.757(16)	36(19)	$\frac{1}{2}^-$
Predicted	[27]	5.49	5	$\frac{1}{2}^-$



Programma Futuro

- Scrivere una rassegna sul metodo a CC e applicazioni. (Accordo con Springer-Verlag).
- Rifare l'analisi del F15, dopo 10 anni dalla predizione e alla luce dei nuovi dati sperimentali.
- Richieste economiche: 2.0 Keu per mantenere le collaborazioni e partecipazione congressi.