

$^1\text{H}(^{14}\text{O},\text{p}):$ GANIL **2016De15,2014St14**

Type	Author	Citation	History	Literature Cutoff Date
Full Evaluation	J. Kelley, T. Truong, C. G. Sheu	ENSDF		17-July-2016

The authors used the  $^{14}\text{O}(\text{p},\text{p})^{14}\text{O}$  elastic scattering reaction, in thick target inverse kinematics, to populate resonant states in  $^{15}\text{F}$ .

The measured excitation function was analyzed via R-matrix formalism, and  $E_{\text{res}}$ ,  $E_x$ ,  $\Gamma$  and  $J^\pi$  values were deduced.

Beams of  $^{14}\text{O}$  ions were produced at the GANIL SPIRAL1 facility by fragmenting  $^{20}\text{Ne}$  ions on a carbon target, and the ions were reaccelerated to 5.91 MeV/nucleon using the CIME cyclotron. The beam was purified in the LISE spectrometer before impinging on a stack of three 50  $\mu\text{m}$  thick polypropylene targets that stopped the beam. Protons from elastic scattering reactions were detected at  $\theta_{\text{cm}}=180^\circ$  ( $\theta_{\text{lab}}=\pm 2.2^\circ$ ) in a  $\Delta\text{E-E}$  (Si-SiLi) detector telescope. The energy resolution of the telescope was measured using  $^{14}\text{N}$  beams to populate  $^{15}\text{O}$  states; an energy resolution of  $\sigma_{\text{cm}}=7$  keV was deduced for  $^{15}\text{F}$  resonances.

The data was analyzed via the thick target inverse kinematics method and evaluated using the AZURE2 R-matrix code. In (2016De15) the properties of three resonances are briefly discussed guided by Gamow Shell model calculations; in an earlier published result (2014St14) only two resonances are evaluated, and their energies are slightly higher.

 $^{15}\text{F}$  Levels

E(level)	$J^\pi$	$\Gamma$	$E(\text{p}+^{14}\text{O})_{\text{cm}}$ (keV)	Comments
0	$1/2^+$	0.38 MeV 21	1270 14	E(level): This resonance was observed at $E_{\text{R}}=1270$ keV 10(stat) 10(sys). $\Gamma$ : The observed width was $\Gamma=376$ keV 70(stat) +200-0(sys).
1493 19	$5/2^+$	305 keV 12	2763 13	E(level): This level was deduced from $E_{\text{R}}=2763$ keV 9(stat) 10(sys) with $E_{\text{R}}=1270$ keV 10(stat) 10(sys) for the g.s. In 2016De15, the authors note that using the statistical procedure outlined by the Particle Data Group to evaluate all reported energies for this resonance they find $E_{\text{R}}=2794$ keV 16 and $\Gamma=301$ keV 16 for this state.
3487 18	$1/2^-$	36 keV 15	4757 12	E(level): This level was deduced from $E_{\text{R}}=4757$ keV 6(stat) 10(sys) with $E_{\text{R}}=1270$ keV 10(stat) 10(sys) for the g.s.