Erratum: $2_1^+ \to 0_1^+$ transition strengths in Sn nuclei [Phys. Rev. C 76, 021302(R) (2007)]

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(Received 17 November 2007; published 12 February 2008)

DOI: 10.1103/PhysRevC.77.029902 PACS number(s): 21.10.Re, 21.10.Tg, 21.60.Cs, 23.20.−g, 99.10.Cd

In our previous work [1], we presented a new lifetime measurement for the 2_1^+ state in ^{112}Sn, as determined through the Doppler-shift attenuation method following the $(n, n'\gamma)$ reaction [2]. Here, the theoretical $F(\tau)$ value with which one compares the measured $F(\tau)_{\rm exp}$ should be modified by an additional term to correct for the recoil velocity distribution when scattering at a neutron energy, E_n, well above the energy threshold, $E_{\rm level}$ [2]. For an angular distribution approximately isotropic in the center of mass, the total $F(\tau)$ is given by

$$F(\tau)_{\rm total} = F(\tau) + F'(\tau, v_0)v_0 \times \left[\frac{3}{5} - \frac{8z(A+1)}{15A} - \frac{z^2(A+1)^2}{15A^2}\right], \quad (1)$$

where $z = \frac{E_{\rm level}}{E_n}$; $F'(\tau, v_0) \times v_0$ is about 0.1 for lifetimes around 500 fs in the $A \sim 50$ region. Hence, this correction may be important and should be added to the standard $F(\tau)$ value.

Subsequent to our previous publication, we have reexamined the corrections for the 2_1^+ state at 1256.7 keV in ^{112}Sn, which adds only 30 fs to the lifetime. This correction was overestimated in our previous publication [1]. As a result, we reported an erroneously long lifetime. A detailed study of the Doppler-shift attenuation method for the long tail of the theoretical $F(\tau)$ curve, i.e., for small $F(\tau)$ values and lifetimes longer than 500 fs, yields a shorter lifetime from the experimental $F(\tau)$ value previously presented. The lifetime of the 2_1^+ state has been redetermined as 535^{+100}_{-80} fs, which gives a larger $B(E2; 2_1^+ \to 0_1^+)$ value of $15.2^{+2.6}_{-2.4}$ W.u., in agreement with the accepted value in the nuclear database [3]. As shown in Fig. 1, the enhancement of $E2$ strengths as the $N = 50$ shell closure approaches still prevails in the even-mass Sn isotopes, as identified in a recent study of ^{108}Sn by Banu and collaborators [4], as well as the disagreement they report with the symmetric trend in the systematics of $E2$ strengths predicted by shell model calculations [4].

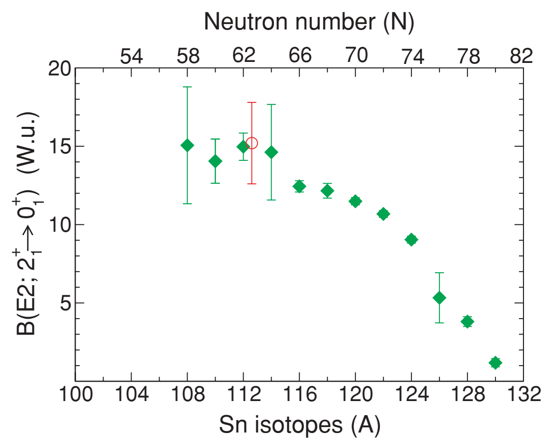

FIG. 1. (Color online) $B(E2; 2_1^+ \to 0_1^+)$ values in even-mass tin isotopes. Data from Refs. [3–5] are shown as diamonds, and the new $B(E2; 2_1^+ \to 0_1^+)$ value for ^{112}Sn is given as an open circle.

We acknowledge T. Belgya for discussions on the DSAM method at the extremes of the F(τ) curve.

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