

12-3-2019

Erratum: Measurement of d+ Be 7 cross sections for big-bang nucleosynthesis (Physical Review Letters (2019) 122 (182701) DOI: 10.1103/PhysRevLett.122.182701)

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Rijal, N., Wiedenhöver, I., Blackmon, J., Anastasiou, M., Baby, L., Caussyn, D., Höflich, P., Kemper, K., Koshchiy, E., & Rogachev, G. (2019). Erratum: Measurement of d+ Be 7 cross sections for big-bang nucleosynthesis (Physical Review Letters (2019) 122 (182701) DOI: 10.1103/PhysRevLett.122.182701). *Physical Review Letters*, 123 (23) <https://doi.org/10.1103/PhysRevLett.123.239902>

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Erratum: Measurement of $d + {}^7\text{Be}$ Cross Sections for Big-Bang Nucleosynthesis [Phys. Rev. Lett. **122**, 182701 (2019)]

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 (Received 17 September 2019; published 3 December 2019)

DOI: 10.1103/PhysRevLett.123.239902

There was an error in the calculation of the BBN outcome for a reaction network “without ${}^7\text{Be} + d$,” represented in Fig. 6 and the text. This particular calculation had been performed with a time step that did not reach full convergence, while the BBN outcome for the network including the reaction had been calculated correctly. The calculations are represented in the revised Fig. 6 and the corresponding statement at the bottom of page 4 is revised to read The reaction network *without* $d + {}^7\text{Be}$ reactions predicts BBN mass fractions of $({}^7\text{Li}/\text{H})_p = 4.66\text{--}4.69 \times 10^{-10}$, whereas our reaction rates predict $({}^7\text{Li}/\text{H})_p = 4.24\text{--}4.61 \times 10^{-10}$.

These BBN calculations were tested to be consistent with the results obtained by Cyburt *et al.* in Ref. [9]. Because of the error in the without ${}^7\text{Be} + d$ reference calculation, the reduction of the ${}^7\text{Li}$ abundance due to the ${}^7\text{Be} + d$ reaction is smaller than presented in the original Letter. The Letter, however, correctly represented the sensitivity of the calculated $({}^7\text{Li}/\text{H})_p$ outcome to the resonance energy, determined as 0.36(5) MeV. The total uncertainty interval in the rate corresponds to a reduction range from 1.4%–8.1% relative to the corrected calculation without ${}^7\text{Be} + d$. If the 0.36(5) MeV resonance is identical to the 0.31(1) MeV resonance identified by Scholl *et al.* [20], the reduction would fall near the maximum of the given interval. Previously, most calculations of BBN used the “CF88” rate, which followed an estimate by Parker [14]. Calculations with that rate remain consistent with the limits of our experiment, as originally stated. It should also be noted that the presence of a resonance and the sensitivity to its energy demonstrates the uncertainty limits that should have been applied to the CF88 estimate.

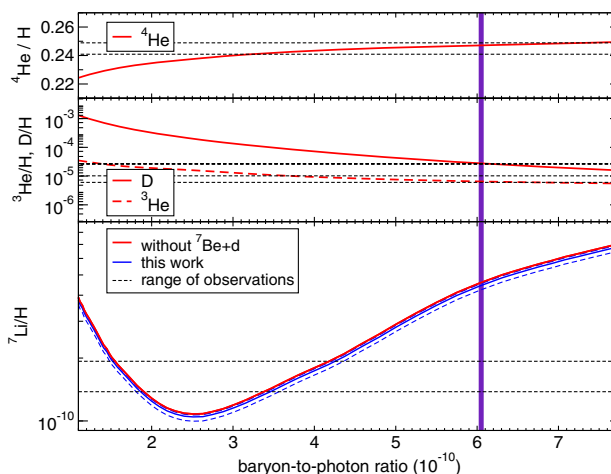


FIG. 6. BBN outcome for light isotopes as a function of baryon-to-photon ratio η . The relative ${}^7\text{Li}$ abundance was calculated using the experimental $d + {}^7\text{Be}$ reaction rate and its uncertainty range, which is compared to a BBN network without the $d + {}^7\text{Be}$ reaction. The latter is the only curve changed with respect to the original Letter. Horizontal dashed lines show range of observations [7].

We thank A. Coc and M. El-Eid for helpful discussions regarding the BBN results, and M. Gai for pointing out the inconsistency with previous BBN calculations.