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Recent results in Big-Bang Nucleosynthesis

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Primordial nucleosynthesis (BBN) has been used for the determination of the baryonic density of the universe. It has now been superseded, for this purpose, by the more precise determination provided by the analysis of the CMB anisotropies by WMAP. Nevertheless, BBN is still very interesting as when we look back into the history of the universe, this is the last era for which, in principle, we know all the physics.
Deviation from BBN predictions can hence give hints on non-standard Big Bang models.

It is thus important that nuclear reactions involved in BBN be known with a good accuracy.
Two recent nuclear physics experiments have improved the reliability of lithium calculated yields in standard big-bang nucleosynthesis.
The cross section for the 7Be(d,p)2alpha reaction has been directly measured at BBN energies at Louvain-la-Neuve.
A coulomb break-up experiment has provided a better determination of the D(alpha,gamma)6Li cross section over a wide energy range.
Nevertheless, the discrepancy between the primordial 7Li abundance deduced from halo stars observations and BBN remains and the BBN 6Li production is still orders of magnitudes below the reported 6Li observations in some halo stars.

Now that the baryonic density is accurately provided by the analysis of the CMB anisotropies, BBN can be used to constrain non-standard models: scalar-tensor theories of gravity for instance.

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