COSMOLOGICAL NUCLEOSYNTHESIS: THE LITHIUM PROBLEM

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A measurement of the primordial Lithium abundance would give a significant observational constraint to current big-bang nucleosynthesis models. Deuterium and helium abundances agree closely with predictions of current cosmological models, however, the predicted primordial lithium abundance is a factor of two above current measurements of the stellar lithium abundance obtained from optical spectroscopy of halo star atmospheres.

Current optical measurements of stellar lithium abundances are subject to significant systematic uncertainties. Millimeter wavelength observations of the ν=0, $J = 0 - 1$ LiH rotational line, red-shifted from its rest frequency near 444 GHz, where it is significantly absorbed in the atmosphere, offer the opportunity to measure interstellar LiH abundance and isotopic ratios in extra-galactic sources. However, these observations have been difficult with older millimeter-wavelength telescopes and arrays, and a search and tentative (2-3 sigma) detection has been reported only towards one source: the lens B0218+357 (Combes & Wiklind 1998, AALett, 334, L81).

We will present the results of our search for ^{7}LiH and ^{6}LiH toward several extragalactic sources.