Abstract Submitted
for the NWS15 Meeting of
The American Physical Society

Self-Consistent Primordial Helium Abundance Determinations using MCMC ERIK AVER, Gonzaga University — The Primordial Helium Abundance is one of the fundamental products of the early Universe and, therefore, offers a unique window into the content and interactions of the Universe only several minutes after the Big Bang. Using measurements from the Cosmic Microwave Background, Big Bang Nucleosynthesis now predicts the initial elemental composition of the universe with high precision. However, recent observational determinations based on spectral observations of H II regions are complicated by systematic effects and do not show complete agreement with each other, or with the CMB prediction. I will discuss recent improvements in these determinations, with particular emphasis on correctly capturing the uncertainty in the result. These will include expanding and updating the physical model, improving self-consistency, introducing Markov Chain Monte Carlo to facilitate rigorous statistical treatment of the uncertainty, and extracting a reliable dataset from recent observations. Discussion of the results will highlight gains made in the reliability and precision of the Primordial Helium Abundance as well as limitations arising from systematic effects and model degeneracies.

Erik Aver
Gonzaga University

Date submitted: 03 Feb 2015 Electronic form version 1.4