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Recent analysis of a new class of proton correlation functions in Lattice QCD¹ MARK MACE, Indiana University, KOSTAS ORGINOS, College of William & Mary — Lattice QCD calculations have become increasingly more accurate due in large part to the refinement of the computational methods needed to calculate the correlation functions required for phenomenology. In this study, we analyze a new class of lattice QCD correlation functions for the proton in order for us to better calculate the ground and excited state masses. This new class is derived from a known class that works well for small volume. Previously efficiency deteriorates for larger volumes. For this reason we focus our study on the volume dependence of noise and the contamination from excited states. Our results indicate as the volume grows, noise is reduced, i.e. our method behaves better as volume grows (in our volume range). In addition the contamination from excited states becomes smaller as volume grows. Overall this method seems to scale well.

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