Confidence interval estimation for NOvA's oscillation measurements using supercomputers[1] STEVEN CALVEZ, Colorado State University, NOVA COLLABORATION, SCIDAC COLLABORATION — NOvA is a long-baseline neutrino oscillation experiment. It measures both the disappearance of muon neutrinos and the appearance of electron neutrinos at a large distance from a source of muon neutrinos in order to constrain neutrino oscillation parameters. In particular, NOvA aims to precisely measure θ_{23} and Δm^2_{32}, as well as determine the neutrino mass hierarchy and probe the existence of CP-violation in the neutrino sector. NOvA is a low-statistics experiment and the neutrino oscillation model contains several physical boundaries. Constructing statistically correct confidence intervals is therefore challenging. NOvA ensures a correct statistical coverage by following the computationally expensive Feldman-Cousins prescription. This approach requires the generation and fitting of millions of pseudo-experiments to build empirical test-statistics distributions. This talk will describe this technique and the framework implemented on supercomputers that reduced the time necessary to produce statistically robust results from several months down to a few days.

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Date submitted: 08 Jan 2021   Electronic form version 1.4