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## Statistical methods and issues in sterile neutrino searches

The statistical issues related to the search for sterile neutrinos are reviewed with focus on short-baseline appearance and disappearance experiments. The sensitivities for limit setting and signal discovery are discussed along with their dependency on the experimental parameters, including the signal rate and the spectral shape. Our baseline analysis is built on a profile-likelihood test statistic that extends the unified approach of Feldman and Cousins by introducing nuisance parameters for the signal and background rate. We examine the differences between methods based on a local and global p-value, and explore the limitations of approaches relying on a Gaussian approximation and the Asimov data set. Our work is particularly relevant given that a large number of sterile neutrino experiments is currently running and in the process of releasing new results.

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