

Abstract

Gas Transport in Mu2e Detector Straws

This paper outlines the steps used to determine whether flow or diffusion is the dominant method for gas transportation through the Mu2e detector straws, and whether the system could operate effectively with multiple straws connected in parallel to a single gas manifold. By measuring the time it takes for the drift gas to traverse the full length of a single straw, and comparing the results when a shorter straw is connected in parallel to the same manifold, it is possible to determine the effects of having multiple straws of different lengths in parallel. The data suggests that flow is the dominant method for gas transportation in the straw, and that each straw should receive an adequate supply of gas in the proposed final design.