

We have investigated methods of reconstructing beam profiles in the penumbral region using a set of axially symmetric extrapolation chambers, differing only in the detector radius. In principal, the transfer functions, or kernels, of such chambers should be functions of radius only. Three chambers of radii 0.297, 0.556, and 0.714 cm. have been used. The profiles from these detectors, when extrapolated back to a zero-size detector, produce a profile that agrees well with the profile measured using a parallel plate microchamber (PPMC) with a 1 mm. collection gap, taken as a measurement of the true beam profile. The transfer functions of the extrapolation chambers can be determined by deconvolving the profiles measured with each detector with the PPMC profile. The results indicate that the transfer functions can be parameterized accurately as a gaussians cut off at 1.5σ , with σ the average radius of the extrapolation chamber. Deconvolution of the measured profiles with the transfer functions yields a profile which should represent the beam profile. In all three cases, the deconvolved beam profile agrees with the PPMC data to ± 0.5 mm. over the 20%-80% penumbral range.