The use of axial image sets has become widely used to localize interstitial brachytherapy sources. One application of this method of localization is to perform post-implant dosimetry following transperineal interstitial permanent prostate brachytherapy (TIPPB) where the advantage of displaying the target structure and the source locations on the same image is crucial. The design of an appropriate scanning sequence often results in abutting slices of an intermediate—in relation to the source size—slice width (3, 4, or 5 mm). Because a single source may be imaged on more than one slice, the resultant scans then show many more source locations than actual sources implanted. The dosimetrist is then faced with tedious task of determining which sources appear on more than one slice and deciding which source locations to eliminate from the data set.

Several treatment planning systems offer the capability of helping the dosimetrist determine which sources appear on multiple slices by using a nearest neighbor criterion. For instance, a source that has neighbors on adjoining slices that fall within a predetermined distance are highlighted to aid in the decision-making process. We have developed an algorithm which automates this process by relaxing the nearest neighbor criterion until the number of sources is reduced to either the number of sources implanted or the number counted on a projection radiograph. This paper details this algorithm and the results of its application to phantom studies, comparing to known source locations, and clinical studies, comparing to orthogonal film source localization.