A high spatial resolution is required to parametrize the small fields employed in stereotactic applications. A radiation detector can perturb the true dose distribution because of its finite size. Mathematically, this is described by the linear equation Ax = b, a straightforward convolution of the inherent beam data (coefficients in matrix A) with the line spread function (LSF) of the detector (vector x) to produce the measured beam data (vector b). The inverse problem (deconvolution) which consists of finding x when given A and b is much more difficult. We have applied the Total Least Squares (TLS) method to solve for the LSF (x). Computer simulations are provided in support of the procedure. In addition, this technique was applied to a real data problem. The deconvolution process is highly sensitive to noise or error and would normally fail to solve the problem. However, deconvolution was made possible in the presence of high levels of noise with the TLS method. A LSF has been obtained for the Markus chamber. This TLS method for deconvolving was applied in small photon field dosimetry for both finding the LSF and correcting for the detector size effect once its LSF is known.