

**Purpose:** In the past, pinhole measurements of x-ray focal spots used high-resolution analog film detectors. With digital detectors replacing film, focal-spot measurements can be made quickly, but care must be taken to account for the potentially poorer spatial resolution and limited usable range of magnifications available. We measured various focal spots with a pinhole camera using a digital flat-panel detector (FPD) and corrected for the blur of the FPD to obtain accurate measurements. **Method and Materials:** A standard FPD with 600 micron thick CsI(Tl) phosphor and 1024X1024 194-micron pixels (Varian PaxScan 2020+) mounted on a C-arm gantry (Toshiba Medical Systems Infinix) was used with a standard 10 micron pinhole (Fluke Biomedical, Model-07-633). The two-dimensional MTF for the FPD was measured very accurately using the newly-developed Noise-Response (NR) method and the pinhole images of the focal spots were deconvolved to correct for the detector blurring. After the pinhole images were rescaled to correct for magnification, the resulting focal spots were compared with those obtained with a very high-resolution detector with 35-micron pixels for which blurring was negligible. **Results:** Results showed very good agreement in the focal-spot sizes measured with the FPD after detector deconvolution and those measured with the high-resolution detector. We measured 0.37 mm for the small and 0.56 mm for the medium focal spot after deconvolution, virtually the same as the sizes measured with the high-resolution detector, 0.36 mm and 0.55 mm, respectively. **Conclusion:** The present study demonstrates that accurate measurement of x-ray focal spots can be done using a standard digital detector as long as the associated detector blurring is removed by deconvolution. Additionally, using the NR method for measuring the two-dimensional MTF, any non-isotropies in detector resolution can be accurately corrected for, enabling routine measurement of non-isotropic x-ray focal spots. (Support: NIH-Grant R01EB002873, Toshiba Equipment Grant)