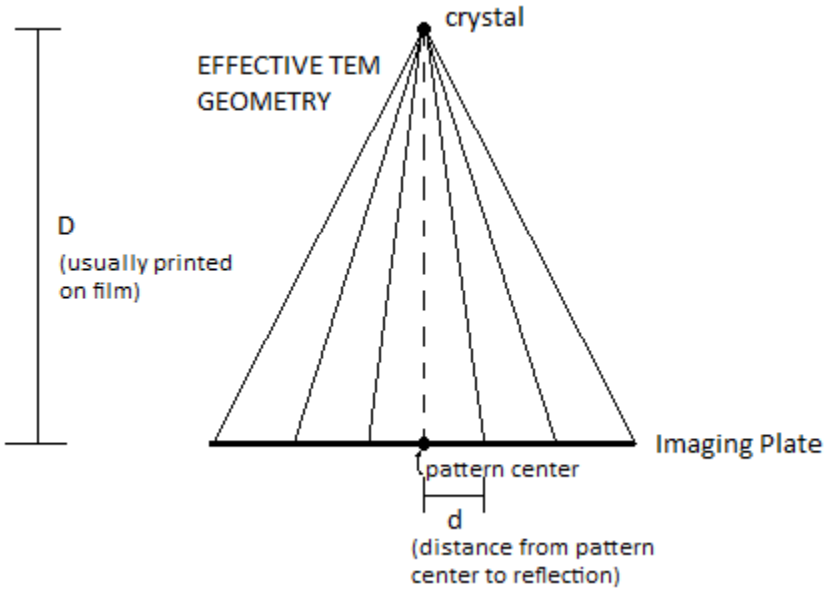
TEM Diffraction Lengths



For an electron energy E in KeV, D and d in the same units, and $n = \sqrt{h^2 + k^2 + l^2}$, the d-spacing of the reflection is given by:

$$d_{spacing} = \frac{4.40n}{\sqrt{512E - E^2}}\left(\frac{\sqrt{D^2 + d^2}}{d}\right) \quad \text{Å}$$

This equation is relativistic, but assumes that the electrons are not of too high energy ($E \leq 1000\ KeV$) so that an approximation used to simplify the expression holds. Also remember that even with a calibration dataset, extraction of accurate cell parameters from an electron diffraction pattern is tricky.