

Magnification/spatial calibration

Comparison: actual data vs extrapolated values

magnification as displayed on the TEM and entered into iTEM, most of the LM range are omitted	linear calibration obtained using standard preparations ¹ (nm/pixel)	extrapolated calibration ³ (nm/pixel)		image size at bin 2× (μm)	
		at bin 1× ⁴	at bin 2× ⁵	width	height
450 000	--	0.08	0.16	0.208	0.282
340 000	--	0.10	0.21	0.275	0.373
245 000	--	0.14	0.29	0.382	0.517
180 000	0.19 ²	0.19	0.39	0.520	0.704
130 000	0.28 ²	0.27	0.54	0.720	0.975
92 000	0.39 ²	0.38	0.76	1.017	1.377
64 000	0.56 ²	0.55	1.09	1.462	1.980
46 000	0.78 ²	0.76	1.52	2.035	2.755
34 000	0.93	1.03	2.06	2.753	3.727
25 000	1.37	1.40	2.80	3.744	5.069
19 000	1.85	1.84	3.69	4.926	6.670
13 500	2.43	2.59	5.19	6.933	9.387
10 500	3.24	3.34	6.67	8.913	12.069
7900	4.21	4.43	8.87	11.847	16.041
5800	5.64	6.04	12.08	16.136	21.849
4600	7.17	7.62	15.23	20.345	27.549
3400	9.76	10.30	20.60	27.526	37.272
2600	12.90	13.47	26.94	35.996	48.740
1950	16.90	17.96	35.92	47.994	64.986
1450	22.27	24.16	48.31	64.544	87.395
1100	30.41	31.84	63.68	85.081	115.203
800	40.43	43.78	87.56	116.986	158.404
620	51.70	56.49	112.99	150.950	204.392
530	64.44	66.09	132.17	176.583	239.101
380	91.09	92.17	184.35	246.287	333.482

¹grating replica except where noted²catalase crystal³"linear calibration" = $(s \times \text{"display magnification"})^{-1}$; where $s=2.855 \times 10^{-5}$, the slope in pixel/nm calculated from a regression analysis of values measured using standard preparations at various magnification⁴2672×4008 pixels, or 2672×3615 pixel when cropped⁵1336×2004 pixels, or 1336×1809 pixel when cropped

Example: calculate a scale bar in pixel using the extrapolated calibration

image taken at a display magnification of 130 000×	scale bar	
	nm	pixel
at bin 1× e.g., 2672×3615 pixel (0.27 nm/pixel)	50	$50 \div 0.27 = 185$
at bin 2× e.g., 1336×1809 pixel (0.54 nm/pixel)	50	$50 \div (0.54) = 93$