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EIGER detector: application in macromolecular crystallography

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Table S1 Data processing statistics (XDS version March 1, 2015) for lys_1 and lys_1 2 × 2 binned data sets (Figure 4).

Resolution (Å)	R_{meas} (%)		$\langle I/\sigma(I) \rangle$		$CC_{1/2}$ (%)	
	0.05° /0.05s	Binned 2x2	0.05° /0.05s	Binned 2x2	0.05° /0.05s	Binned 2x2
4.07	3.3	3.3	63.62	64.27	99.9	99.9
2.93	4.2	4.2	59.92	60.17	99.9	99.9
2.41	5.8	5.9	44.77	43.93	99.9	99.9
2.10	7.9	8.0	33.26	32.57	99.8	99.8
1.88	12.2	12.6	20.93	20.51	99.7	99.6
1.72	21.3	22.6	11.61	11.29	99.1	98.9
1.59	34.7	38.9	7.06	6.49	97.3	96.5
1.49	50.7	63.2	3.61	2.95	89.0	84.5
1.40	64.9	98.9	2.00	1.35	62.0	56.2
Total	6.7	7.2	20.96	20.46	99.9	99.9

Table S2 Data processing statistics (XDS version Oct 15, 2015) for lys_1 and lys_2 (SUM40) data sets (Figure 6).

Resolution (Å)	R_{meas} (%)		$\langle I/\sigma(I) \rangle$		$CC_{1/2}$ (%)	
	0.05° /0.05s	SUM40	0.05° /0.05s	SUM40	0.05° /0.05s	SUM40
4.07	3.1	3.0	71.05	72.17	100	100
2.93	3.8	3.8	66.19	66.71	99.9	100
2.41	5.3	5.4	48.99	48.69	99.9	99.9
2.10	7.2	7.4	36.41	36.03	99.9	99.8
1.88	10.9	11.1	23.64	23.10	99.8	99.7
1.72	18.4	19.3	13.50	12.98	99.4	99.3
1.59	28.4	30.4	8.70	8.22	98.3	98.0
1.49	42.4	45.7	4.70	4.38	92.9	91.7
1.40	55.4	58.7	2.63	2.46	75.5	75.0
Total	6.3	6.3	23.28	23.04	100	100

Table S3 Data processing statistics (XDS version Oct 15, 2015) for different summation of frames in lys_2 data set (Figure 7).

Resolution (Å)	R_{meas} (%)					
	SUM5	SUM10	SUM20	SUM40	SUM80	SUM160
4.07	2.9	3.0	3.0	3.0	3.0	2.9
2.93	3.6	3.8	3.8	3.8	3.8	3.7
2.41	5.1	5.3	5.4	5.4	5.3	5.3
2.10	6.9	7.1	7.4	7.4	7.3	7.2
1.88	9.9	10.0	11.1	11.1	10.9	10.9
1.72	16.0	15.9	18.5	19.3	19.1	19.3
1.59	24.3	23.4	27	30.4	30.8	31.2
1.49	34.3	33.5	36.1	45.7	48.9	50.8
1.40	44.8	45.3	44.6	58.7	74.3	79.6
Total	5.8	5.9	6.2	6.3	6.3	6.4

Resolution (Å)	$\langle I/\sigma(I) \rangle$					
	SUM5	SUM10	SUM20	SUM40	SUM80	SUM160
4.07	75.11	72.74	71.62	72.17	72.95	73.85
2.93	70.74	68.22	66.55	66.71	67.24	67.91
2.41	53.19	51.64	49.09	48.69	48.95	49.21
2.10	40.49	39.39	36.5	36.03	36.29	36.45
1.88	26.48	26.45	23.59	23.1	23.38	23.34
1.72	15.20	15.42	13.75	12.98	13.08	13.02
1.59	9.88	10.09	9.19	8.22	8.09	8.04
1.49	5.37	5.48	5.24	4.38	4.06	3.96
1.40	2.92	2.86	2.92	2.46	1.98	1.89
Total	25.5	24.99	23.57	23.04	23.08	23.15

Resolution (Å)	$CC_{1/2}$ (%)					
	SUM5	SUM10	SUM20	SUM40	SUM80	SUM160
4.07	100	100	100	100	100	100
2.93	99.9	99.9	99.9	100	99.9	99.9
2.41	99.9	99.9	99.9	99.9	99.9	99.9
2.10	99.9	99.9	99.8	99.8	99.9	99.9
1.88	99.8	99.8	99.7	99.7	99.7	99.7
1.72	99.4	99.4	99.2	99.3	99.2	99.3
1.59	98.1	98.2	97.9	98.0	98.0	98.0
1.49	92.5	93.6	92.9	91.7	91.9	92.0
1.40	77.3	80.3	77.9	75.0	75.9	73.7
Total	100	99.9	100	100	100	100

Table S4 Data processing statistics (XDS version Oct 15, 2015) for different summation of frames in ins_1 data set (Figure 8).

Resolution (Å)	R_{meas} (%)					
	SUM5	SUM10	SUM20	SUM40	SUM80	SUM160
5.10	2.5	2.5	2.5	2.6	2.6	2.5
3.73	2.4	2.4	2.5	2.5	2.5	2.5
3.08	3.2	3.3	3.3	3.3	3.4	3.5
2.68	5.3	5.4	5.5	5.4	5.5	5.7
2.41	7.8	7.9	8.1	8.1	8.3	8.9
2.20	11.9	12.4	12.6	12.7	13.3	14.4
2.04	17.6	18.1	19.1	19.5	20.5	22.8
1.91	29.2	31.7	34.0	35.9	38.6	44.3
1.81	42.4	47.2	53.5	58.6	64.3	73.9
Total	4.5	4.5	4.6	4.8	4.9	5.2

Resolution (Å)	$\langle I/\sigma(I) \rangle$					
	SUM5	SUM10	SUM20	SUM40	SUM80	SUM160
5.10	86.37	83.61	81.63	82.12	82.01	82.75
3.73	87.98	84.95	82.95	83.25	83.00	83.57
3.08	65.50	62.79	61.22	61.01	60.43	59.82
2.68	42.70	41.72	39.65	39.16	38.40	37.44
2.41	30.23	28.79	28.04	27.59	26.84	25.68
2.20	19.59	18.51	17.98	17.59	16.83	15.80
2.04	13.68	12.67	12.16	11.92	11.41	10.54
1.91	7.83	7.22	6.71	6.44	6.08	5.46
1.81	4.98	4.53	4.05	3.73	3.46	3.06
Total	30.50	29.09	28.21	27.97	27.48	26.81

Resolution (Å)	$CC_{1/2}$ (%)					
	SUM5	SUM10	SUM20	SUM40	SUM80	SUM160
5.10	99.9	100	100	100	100	100
3.73	100	100	100	100	100	100
3.08	99.9	99.9	99.9	99.9	100	100
2.68	99.9	99.9	99.9	99.9	99.9	99.9
2.41	99.8	99.7	99.7	99.7	99.7	99.7
2.20	99.6	99.6	99.6	99.6	99.6	99.5
2.04	99.1	99.1	99.1	99.1	99.0	98.8
1.91	96.6	96.7	96.6	96.7	96.2	94.6
1.81	92.6	91.6	91.8	91.3	89.3	86.2
Total	99.9	100	100	100	100	100

Table S5 Data processing statistics (XDS version Oct 15, 2015) for different skipping frames of lys_2 and ins_1 data sets (Figure 9).

lys_2 data

Resoluti on (Å)	R_{meas} (%)			$\langle I/\sigma(I) \rangle$			$CC_{1/2}$ (%)		
	SUM40	SUM20 SKIP20	20SUM 1SKIP1	SUM40	SUM20 SKIP20	20SUM 1SKIP1	SUM40	SUM20 SKIP20	20SUM 1SKIP1
4.07	3	3.3	3.2	72.17	67.44	68.9	100	100	100
2.93	3.8	4.1	4.1	66.71	61.26	62.08	100	99.9	99.9
2.41	5.4	6.3	6.3	48.69	42.23	42.3	99.9	99.9	99.9
2.10	7.4	9.0	9.1	36.03	30.10	29.89	99.8	99.8	99.8
1.88	11.1	14.1	14.3	23.10	18.63	18.48	99.7	99.6	99.5
1.72	19.3	24.8	25.0	12.98	10.51	10.39	99.3	98.7	98.6
1.59	30.4	36.3	36.2	8.22	6.98	6.93	98.0	96.2	96.4
1.49	45.7	49.4	49.5	4.38	3.90	3.83	91.7	86.5	87.2
1.40	58.7	62.5	64.4	2.46	2.15	2.11	75	64.8	60.8
Total	6.3	7.5	7.5	23.04	20.06	20.13	100	99.9	100

ins_1 data

Resoluti on (Å)	R_{meas} (%)			$\langle I/\sigma(I) \rangle$			$CC_{1/2}$ (%)		
	SUM40	SUM20 SKIP20	20SUM 1SKIP1	SUM40	SUM20 SKIP20	20SUM 1SKIP1	SUM40	SUM20 SKIP20	20SUM 1SKIP1
5.09	2.5	4.0	2.8	82.96	54.86	72.57	100	99.9	100
3.72	2.5	4.4	2.9	84.05	55.64	72.26	100	99.9	100
3.07	3.4	5.4	4.3	61.33	41.56	49.41	100	99.9	99.9
2.68	5.6	8.2	7.7	39.41	27.19	29.85	99.9	99.8	99.8
2.40	8.2	11.7	11.6	27.30	19.00	20.04	99.8	99.5	99.5
2.20	13.1	18.4	18.6	17.24	12.00	12.38	99.6	99.1	98.9
2.04	19.8	27.7	27.9	11.59	8.02	8.20	99.2	98.1	98
1.91	36.4	49.3	49.8	6.31	4.36	4.38	96.7	92.8	93.7
1.80	59.5	78.5	79.6	3.65	2.49	2.54	91	84.6	82.9
Total	4.9	7.3	6.2	27.97	18.98	22.14	100	99.9	100

Table S6 Data processing statistics (XDS version Oct 15, 2015) for high rotation speed data sets lys_3 – 10 (Figure 10).

Resolution (Å)	R_{meas} (%)							
	1 (SUM5)	10	20	45	90	180	360	720
4.32	3.2	3.4	3.5	3.8	4.0	4.5	5.8	7.7
3.12	3.9	4.1	4.2	4.2	4.1	4.4	5.2	6.6
2.57	5.4	5.5	5.6	5.7	5.2	5.3	5.5	6.1
2.23	7.5	7.4	7.7	7.7	7.2	7.1	7.2	7.9
2.00	10.2	10.0	10.7	10.6	9.9	9.8	9.9	11.0
1.83	16.5	15.7	17.0	18.2	17.1	17.0	17.0	19.1
1.69	26.9	25.0	26.7	31.7	30.7	31.8	31.0	35.2
1.59	39.4	37.6	38.9	49.3	52.0	54.4	53.1	60.5
1.50	50.4	52.8	53.8	71.1	86.2	90.3	93.0	108.1
Total	6.9	6.8	7.2	7.5	7.4	7.7	8.6	10.2

Resolution (Å)	$\langle I/\sigma(I) \rangle$							
	1 (SUM5)	10	20	45	90	180	360	720
4.32	65.8	62.82	60.87	58.34	59.72	54.30	45.76	36.99
3.12	64.85	62.35	60.09	57.96	59.8	55.24	47.55	38.88
2.57	48.73	47.61	45.27	43.78	45.6	43.54	40.06	33.94
2.23	36.44	36.99	34.83	33.54	35.13	34.31	32.69	28.9
2.00	26.43	27.34	25.4	24.18	25.56	25.36	25.08	22.84
1.83	15.69	16.66	15.74	14.45	15.3	15.36	15.8	14.77
1.69	9.48	9.93	9.65	8.41	8.75	8.78	9.26	8.81
1.59	6.29	6.48	6.38	5.37	5.24	5.20	5.66	5.38
1.50	3.51	3.39	3.42	2.8	2.48	2.44	2.60	2.45
Total	23.80	23.81	22.72	21.45	22.20	21.30	20.06	17.56

Resolution (Å)	$CC_{1/2}$ (%)							
	1 (SUM5)	10	20	45	90	180	360	720
4.32	100	100	99.9	99.9	99.9	99.8	99.7	99.4
3.12	99.9	99.9	99.9	99.9	99.9	99.8	99.8	99.6
2.57	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.8
2.23	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8
2.00	99.7	99.8	99.7	99.7	99.7	99.8	99.7	99.7
1.83	99.4	99.4	99.4	99.3	99.5	99.5	99.5	99.4
1.69	98.1	98.6	98.4	98.2	98.4	98.4	98.5	98.1
1.59	93.1	95.0	94.4	94.2	94.6	94.2	94.6	93.8
1.50	77.4	80.0	78.4	75.3	75.9	77.4	76.3	73.8
Total	100	99.9	99.9	99.9	99.9	99.9	99.9	99.8

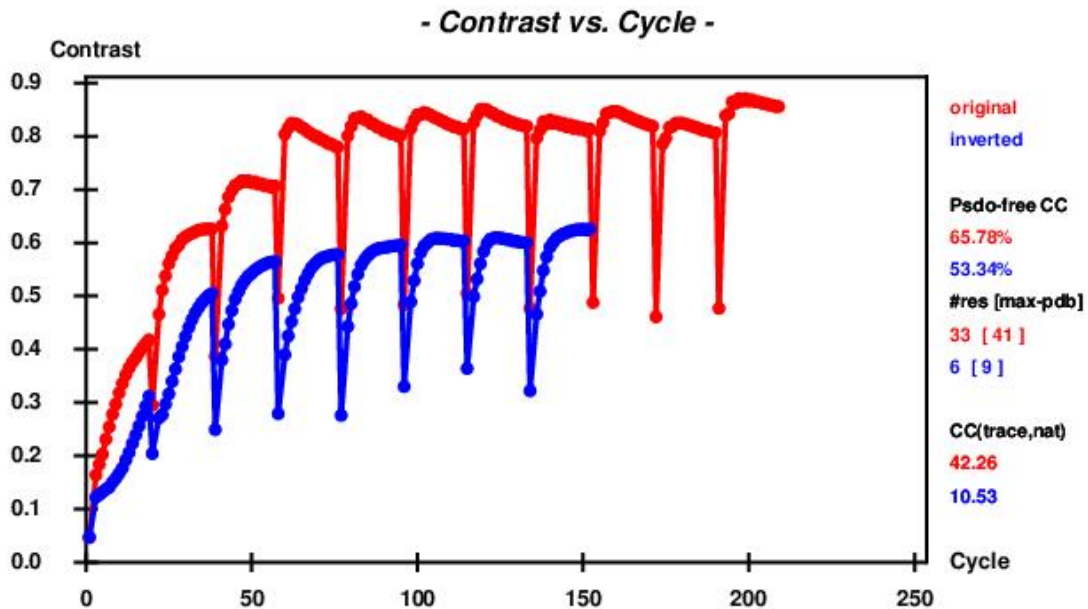
lys_3 – 10 data sets processed with same 0.9° rotation angle

Resolution (Å)	R_{meas} (%)							
	1	10	20	45	90	180	360	720
4.32	3.1	3.1	3.2	3.5	4.0	4.6	5.9	7.7
3.12	3.8	3.8	3.8	3.9	4.2	4.6	5.4	6.6
2.57	5.7	5.4	5.5	5.5	5.4	5.6	5.7	6.1
2.23	8.3	7.8	7.9	7.8	7.8	7.8	7.8	7.9
2.00	12.6	11.4	11.8	11.3	11.3	11.2	11	11
1.83	23.3	20.9	21.4	20.7	20.7	20.7	19.5	19.1
1.69	44.5	38.6	40.2	38.5	38.3	39.4	36.1	35.2
1.59	75.5	66.7	68.8	65.3	66.2	67.3	61.7	60.5
1.50	127.9	114	118.5	113.5	114.1	117.2	109.2	108.1

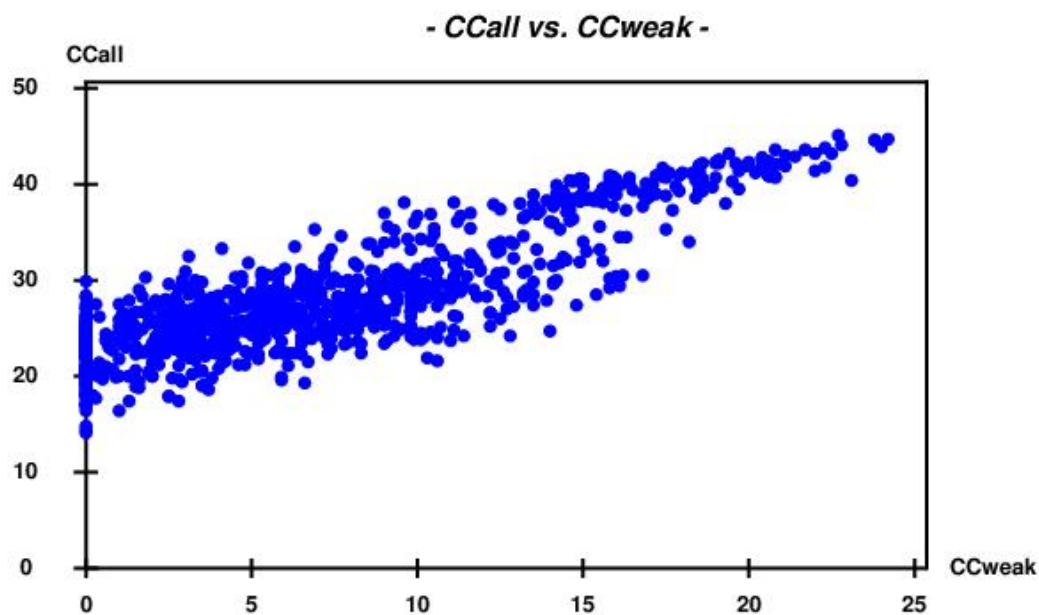
Table S7 Data processing statistics (XDS version Oct 15, 2015) for one second native-SAD data set ins_2 (Suppl. Figure 1).

Resolution (Å)	R_{meas} (%)	$\langle I/\sigma(I) \rangle$	$CC_{1/2}$ (%)
6.81	2.2	62.86	99.9
4.85	2.1	59.52	99.9
3.97	2.2	55.75	99.9
3.45	2.6	47.17	99.9
3.08	3.9	32.67	99.8
2.82	5.9	19.53	99.6
2.61	9.4	10.91	99.8
2.44	13.4	6.05	97.3
2.30	24.4	2.99	91.9
total	2.8	29.59	99.9

Figure S1 One second native-SAD experiment. A quadrant of an EIGER 16M was used to simulate a EIGER 4M(16M) detector. A one second data collection time native-SAD experiment was attempted with an insulin crystal (data set *insu_2*). The CC_{all} versus CC_{weak} in SHELXD and contrast versus cycle of density modification in SHLXE are depicted.



(a)



(b)