

EMVA 1288 Standard Specification Sheet

Camera Information	
Vendor Name	Prosilica Inc.
Camera Name	GC1380
UID	5016
Serial Number	02-2140A-05016
Part Number	2140
Part Version	65
Interface ID	2
Interface Type	Gigabit Ethernet
Frame Resolution	1360x1024
Sensor Name	SONY ICX285
Sensor Type	Mono16
Pixel Bit Depth	12
Sensor Diagonal (mm)	10.9805
Pixel Dimensions (μm)	6.45x6.45
Number of Taps	1
Dark Current Compensation	Yes

Test Settings	
ROI	
x_start	630
y_start	462
x_length	100
y_length	100
Other	
Acquisition Mode	Freerun
Gain	0
Exposure Range (μs)	100 - 20000
Number of Data Points	50
Binning X	1
Binning Y	1
Housing Temperature (°C)	

Test Settings (Continued)	
Filter Wavelength (nm)	Light Intensity (W/m ²)
546	1.5232E-02

Additional Notes	
None	

Warnings	
-None	

Measurement Data ($\lambda=546\text{nm}$)									
Image #	T_{exp} (s)	$\mu_{y,\text{dark}}$ (DN)	$\sigma^2_{y,\text{dark}}$ (DN)	μ_y (DN)	σ^2_y (DN)	μ_p (Photons)	$\mu_y - \mu_{y,\text{dark}}$ (DN)	$\sigma^2_y - \sigma^2_{y,\text{dark}}$ (DN)	$\text{SNR}_y(\mu_p)$
1	0.000100	15.621	2.937	38.948	8.051	173.949	23.326	5.114	8.220965115
2	0.000506	15.606	2.838	133.801	24.204	880.394	118.195	21.366	24.02464393
3	0.000912	15.665	3.164	229.223	46.135	1586.839	213.558	42.971	31.44136212
4	0.001318	15.566	3.063	328.660	67.692	2293.284	313.094	64.629	38.05447835
5	0.001724	15.711	2.956	423.781	88.338	2999.729	408.070	85.381	43.41716323
6	0.002131	15.684	3.162	521.046	106.969	3706.173	505.361	103.807	48.86217848
7	0.002537	15.664	2.956	617.627	124.712	4412.618	601.963	121.756	53.90345328
8	0.002943	15.583	2.990	713.366	149.715	5119.063	697.783	146.725	57.02794973
9	0.003349	15.670	3.020	812.918	170.786	5825.508	797.248	167.766	61.00523765
10	0.003755	15.632	3.167	908.243	171.957	6531.953	892.611	168.791	68.06938608
11	0.004161	15.617	3.091	1004.263	197.961	7238.398	988.646	194.870	70.26699807
12	0.004567	15.497	2.998	1099.982	225.262	7944.843	1084.486	222.263	72.25699199
13	0.004973	15.646	3.105	1193.808	238.242	8651.288	1178.163	235.137	76.33021081
14	0.005380	15.757	3.110	1290.552	263.368	9357.733	1274.795	260.259	78.55227087
15	0.005786	15.685	2.960	1385.361	262.547	10064.178	1369.676	259.587	84.53062394
16	0.006192	15.596	3.145	1478.849	292.746	10770.623	1463.254	289.601	85.52133224
17	0.006598	15.636	2.973	1572.632	308.136	11477.068	1556.997	305.163	88.69850712
18	0.007004	15.664	3.137	1665.476	301.630	12183.513	1649.812	298.493	94.99426308
19	0.007410	15.686	3.060	1759.670	372.140	12889.958	1743.984	369.080	90.40430411
20	0.007816	15.605	3.049	1854.478	361.115	13596.403	1838.874	358.066	96.76743599
21	0.008222	15.681	3.225	1945.689	355.217	14302.848	1930.009	351.992	102.4029368
22	0.008629	15.662	2.988	2037.922	380.935	15009.293	2022.260	377.947	103.6123655
23	0.009035	15.604	3.128	2129.993	394.796	15715.737	2114.389	391.668	106.4140029
24	0.009441	15.688	2.842	2220.843	421.567	16422.182	2205.155	418.724	107.4004436
25	0.009847	15.653	3.199	2313.572	420.869	17128.627	2297.919	417.670	112.0111033
26	0.010253	15.652	3.121	2404.073	424.355	17835.072	2388.421	421.234	115.9434921
27	0.010659	15.686	2.958	2492.903	455.547	18541.517	2477.217	452.590	116.0639189
28	0.011065	15.695	3.120	2581.820	463.433	19247.962	2566.126	460.313	119.2021991
29	0.011471	15.673	2.991	2670.707	472.951	19954.407	2655.034	469.960	122.0848601

Measurement Data									
Image #	T _{exp} (s)	$\mu_{y,\text{dark}}$ (DN)	$\sigma^2_{y,\text{dark}}$ (DN)	μ_y (DN)	σ^2_y (DN)	μ_p (Photons)	$\mu_y - \mu_{y,\text{dark}}$ (DN)	$\sigma^2_y - \sigma^2_{y,\text{dark}}$ (DN)	SNR _y (μ_p)
30	0.011878	15.672	3.272	2759.727	490.356	20660.852	2744.055	487.084	123.9187644
31	0.012284	15.669	2.796	2847.016	482.358	21367.297	2831.347	479.562	128.9164574
32	0.012690	15.695	3.080	2933.296	469.270	22073.742	2917.601	466.190	134.6836053
33	0.013096	15.631	3.122	3017.365	500.244	22780.187	3001.735	497.122	134.2088982
34	0.013502	15.662	2.977	3101.203	488.177	23486.632	3085.541	485.201	139.6504811
35	0.013908	15.713	3.110	3183.931	492.065	24193.077	3168.217	488.955	142.8247962
36	0.014314	15.660	3.018	3266.748	539.249	24899.522	3251.088	536.231	140.0019586
37	0.014720	15.721	3.140	3346.088	493.766	25605.967	3330.368	490.627	149.8757733
38	0.015127	15.643	3.049	3424.998	473.995	26312.412	3409.355	470.946	156.5977462
39	0.015533	15.646	2.543	3499.356	429.639	27018.857	3483.711	427.095	168.0700718
40	0.015939	15.674	3.158	3570.964	414.116	27725.301	3555.290	410.959	174.7084162
41	0.016345	15.651	2.945	3640.612	395.406	28431.746	3624.961	392.460	182.2980378
42	0.016751	15.691	3.254	3703.288	334.058	29138.191	3687.597	330.804	201.7588997
43	0.017157	15.737	2.999	3759.444	287.138	29844.636	3743.708	284.138	220.9310651
44	0.017563	15.608	2.839	3815.052	234.490	30551.081	3799.445	231.651	248.1178378
45	0.017969	15.577	3.148	3855.697	164.058	31257.526	3840.120	160.910	299.8097844
46	0.018376	15.644	2.947	3888.240	127.014	31963.971	3872.596	124.067	343.6184111
47	0.018782	15.729	3.250	3915.189	86.050	32670.416	3899.461	82.801	420.3664806
48	0.019188	15.689	2.983	3938.433	91.035	33376.861	3922.745	88.052	411.1368967
49	0.019594	15.701	3.062	3951.378	54.554	34083.306	3935.677	51.491	532.8523827
50	0.020000	15.797	3.047	3954.321	95.355	34789.751	3938.524	92.308	403.3316651

Model Parameters ($\lambda=546\text{nm}$)			
Parameter	Symbol	Units	Value
Inverse of Overall System Gain	$1/K$	e-/DN	5.2168
Total Quantum Efficiency	$\eta(\lambda)$	%	68.8955
Dark Current	N_d	e- / s	0.0000
Dark Noise for Exposure Time Zero	σ_{d0}	e-	9.1029
Full Well Capacity	$\mu_{e,sat}$	e-	15409.6328
Absolute Sensitivity Threshold	$\mu_{p,min}(\lambda)$	p~	13.2126
Dynamic Range	$DYN_{in} = DYN_{out}$	1	1692.8315
Signal to Noise Ratio	SNR	dB	64.5723
Signal to Noise Ratio at Saturation	$SNR_y(\mu_{p,sat})$	1	128.7447
Standard Deviation of Spatial Gain Noise	S_g	%	
Standard Deviation of Spatial Offset Noise	σ_o	e-	
PRNU ₁₂₈₈		%	
DSNU ₁₂₈₈		e-	

Extended Photon Transfer Curve Graphs ($\lambda=546\text{nm}$)

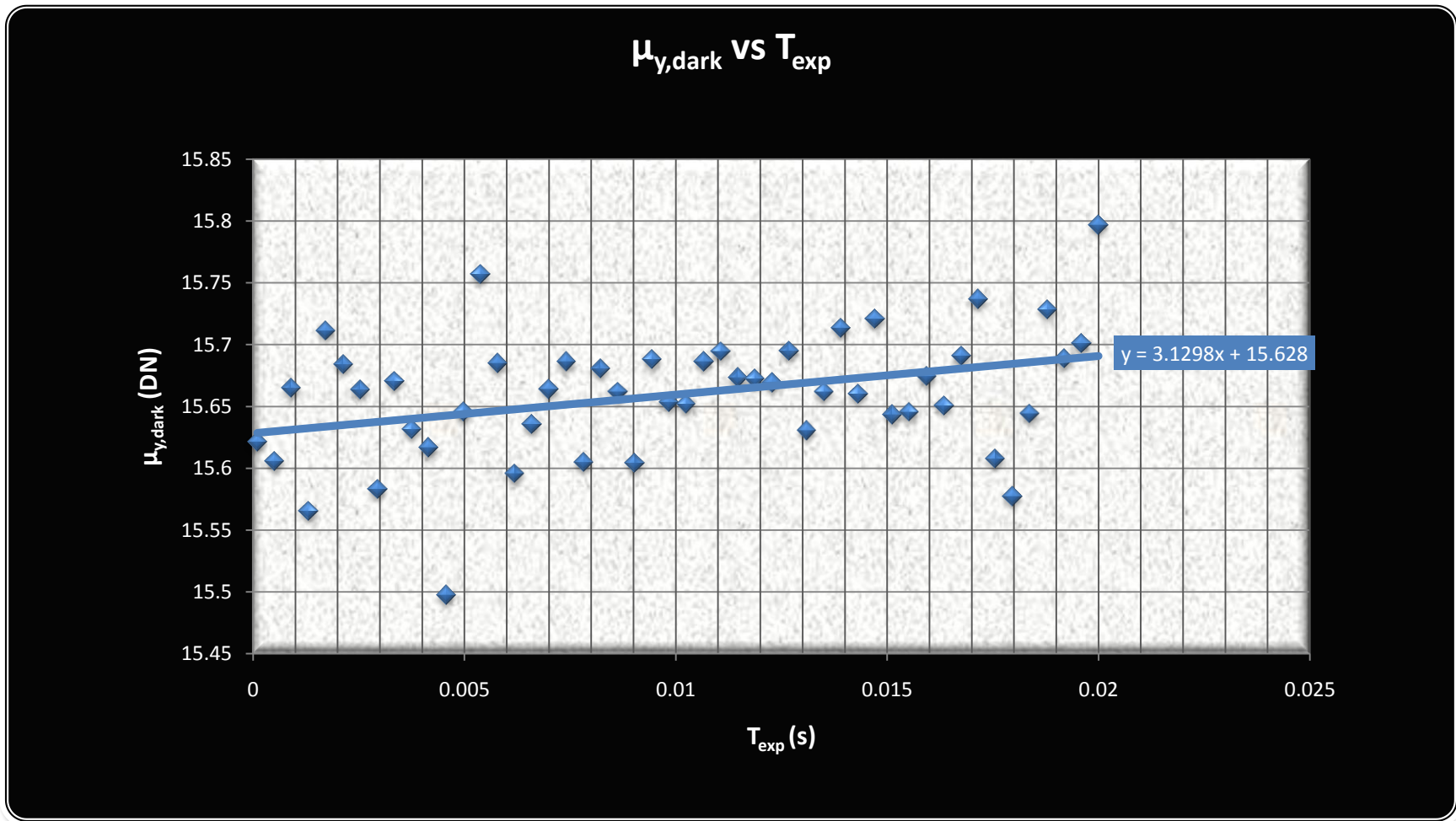


Figure 1: Mean gray value of the dark signal in [DN] versus exposure time in [s].

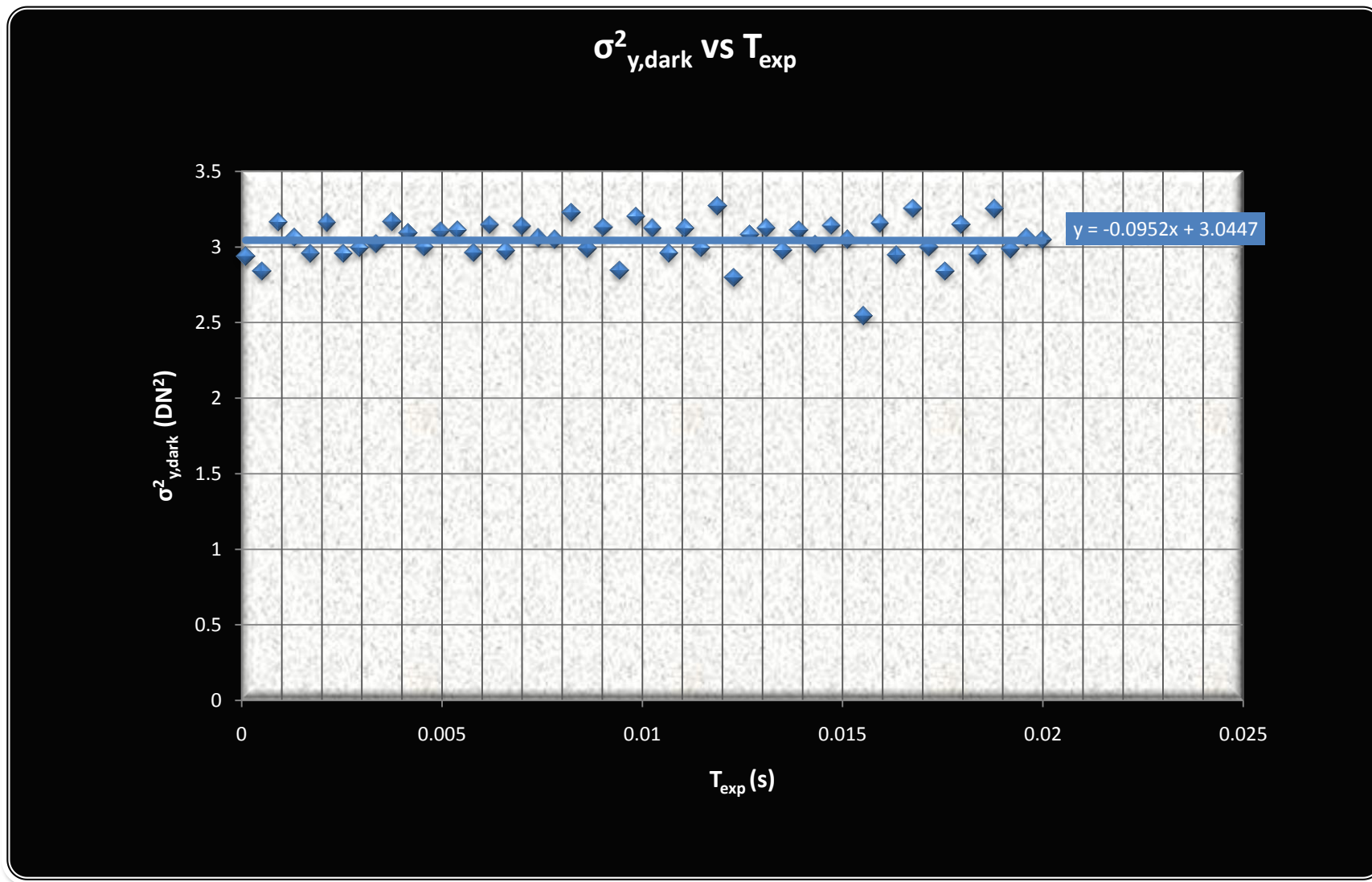


Figure 2: Variance of the gray values' temporal distribution in dark in $[\text{DN}^2]$ versus exposure time in $[\text{s}]$.

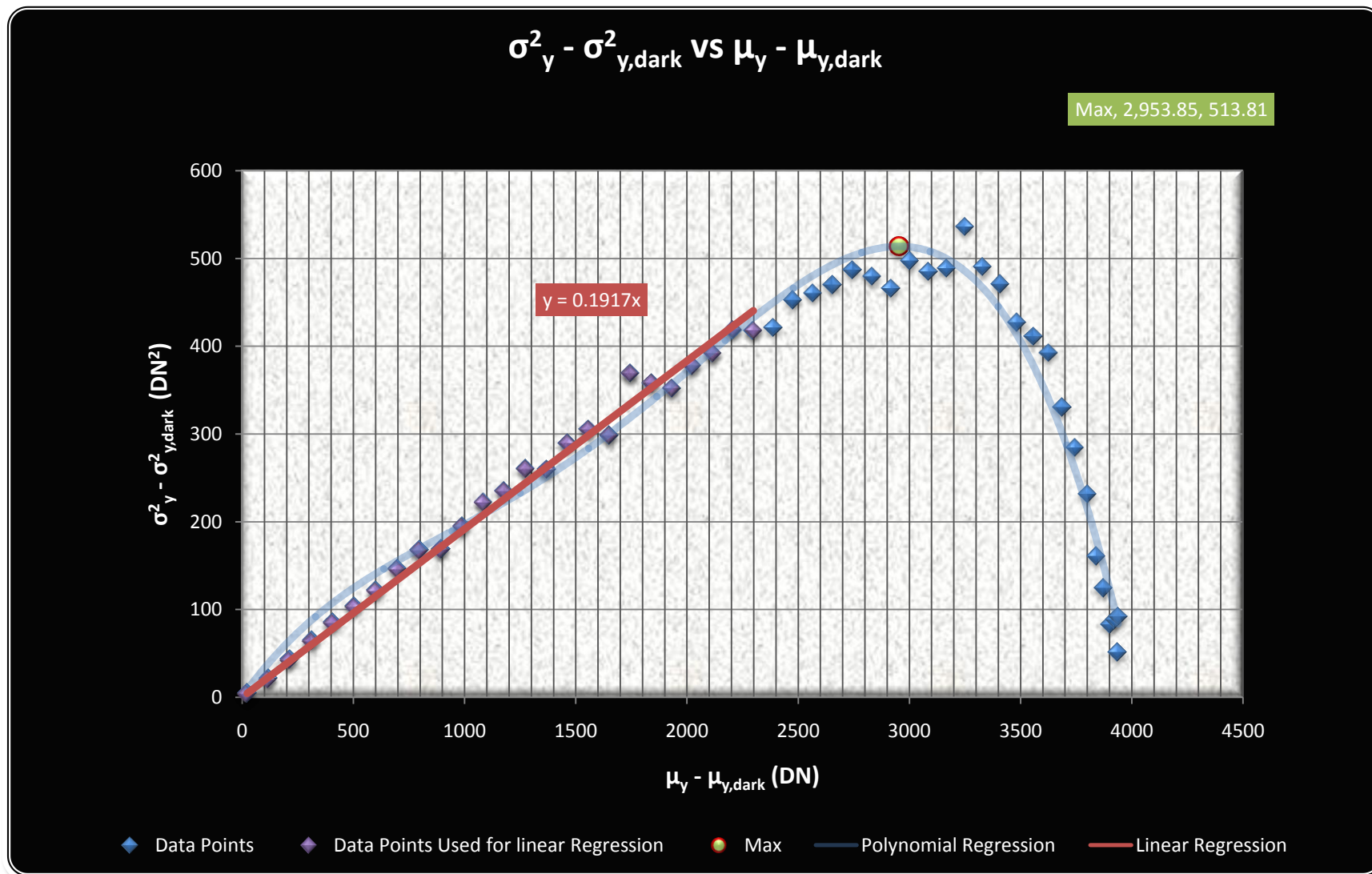


Figure 3: Light induced variance of temporal distribution of gray values in $[\text{DN}^2]$ versus light induced mean gray value in $[\text{DN}]$.

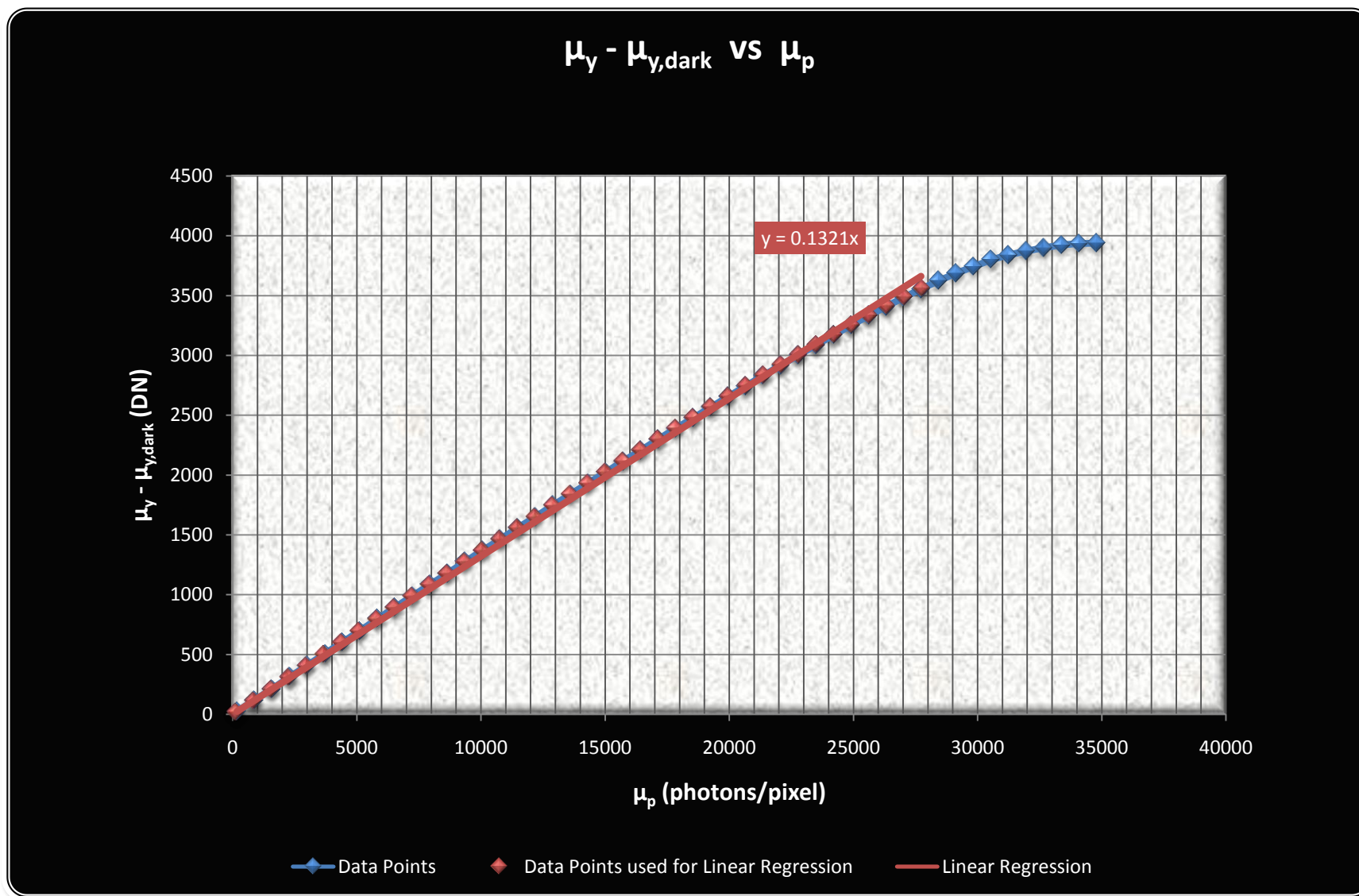


Figure 4: Light induced mean gray value in [DN] versus the number of photons collected in a pixel during exposure time in [p-].

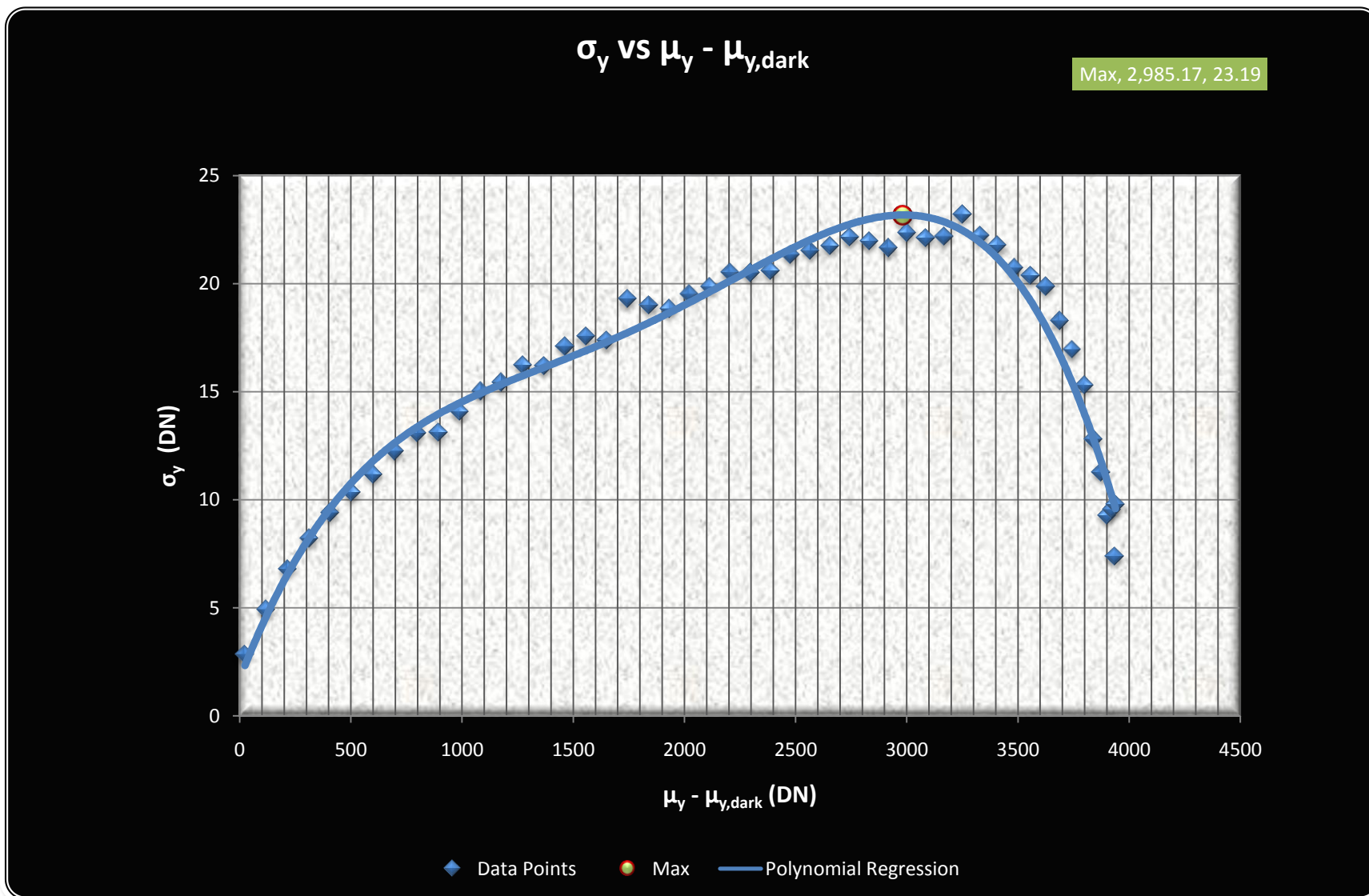


Figure 5: Standard deviation of grey value in [DN] versus the light induced mean gray value in [DN].

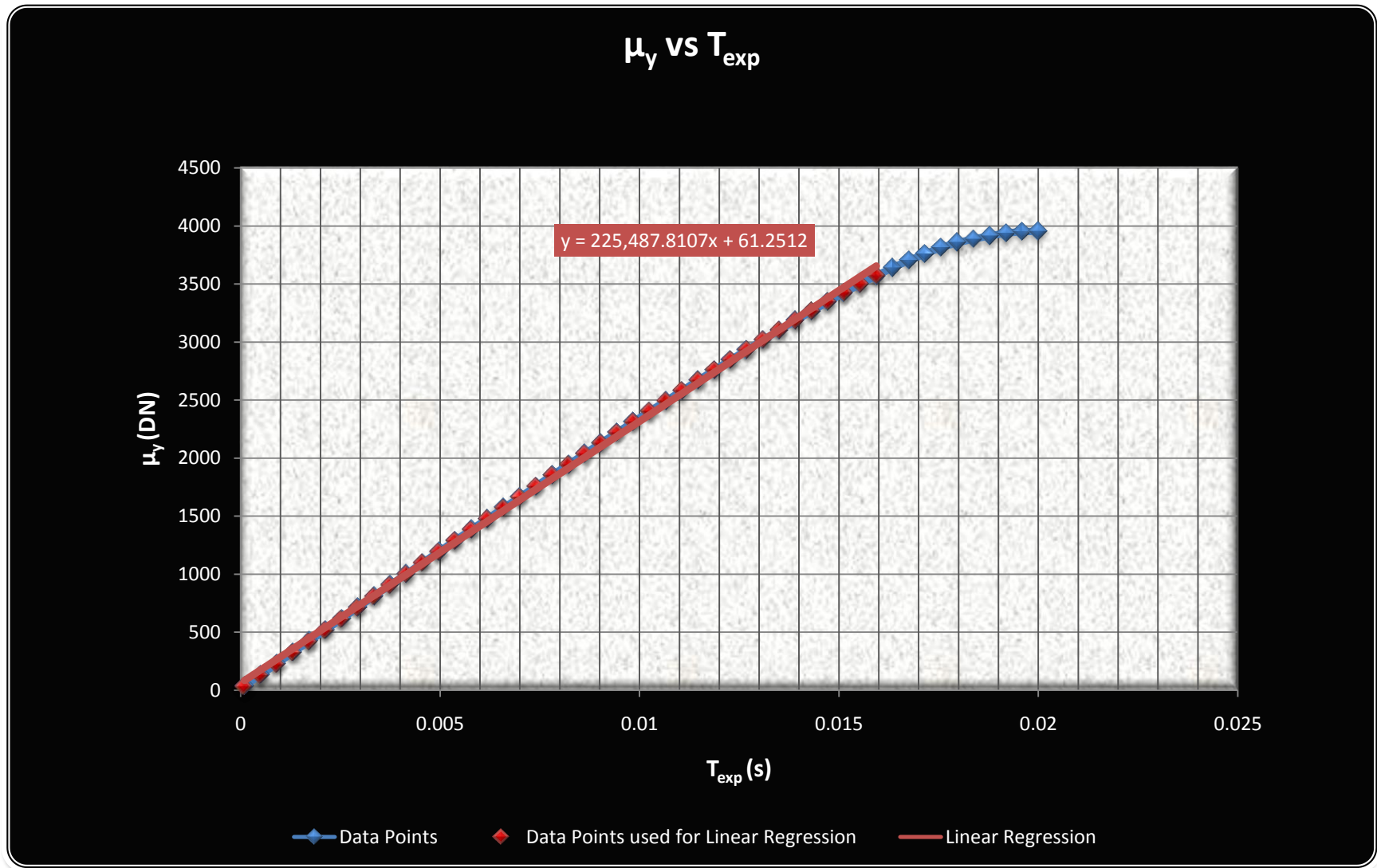


Figure 6: Mean gray value in [DN] versus set exposure time [s].

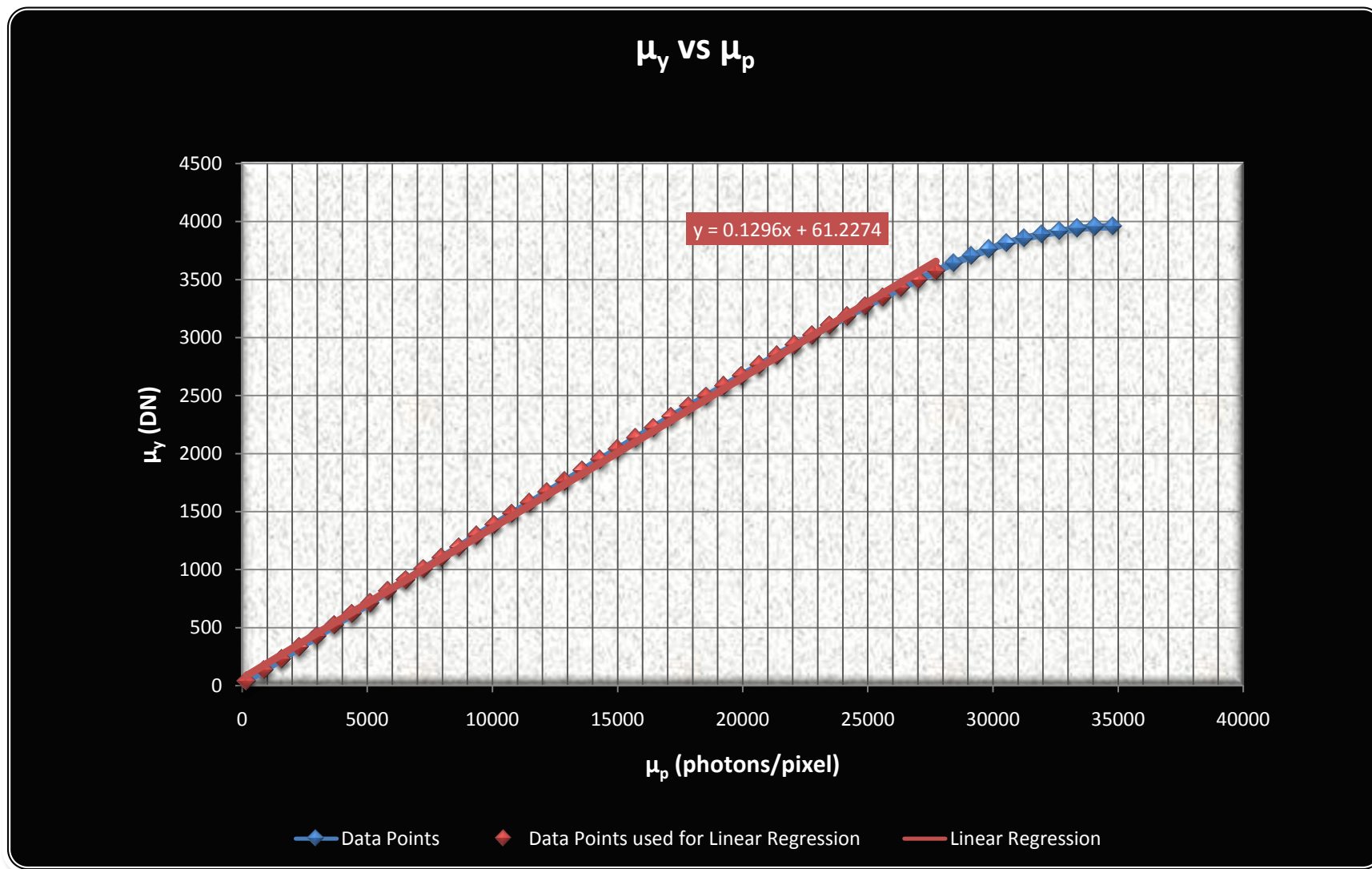


Figure 7: Mean gray value in [DN] versus the number of photons collected in a pixel during exposure time in [p.]

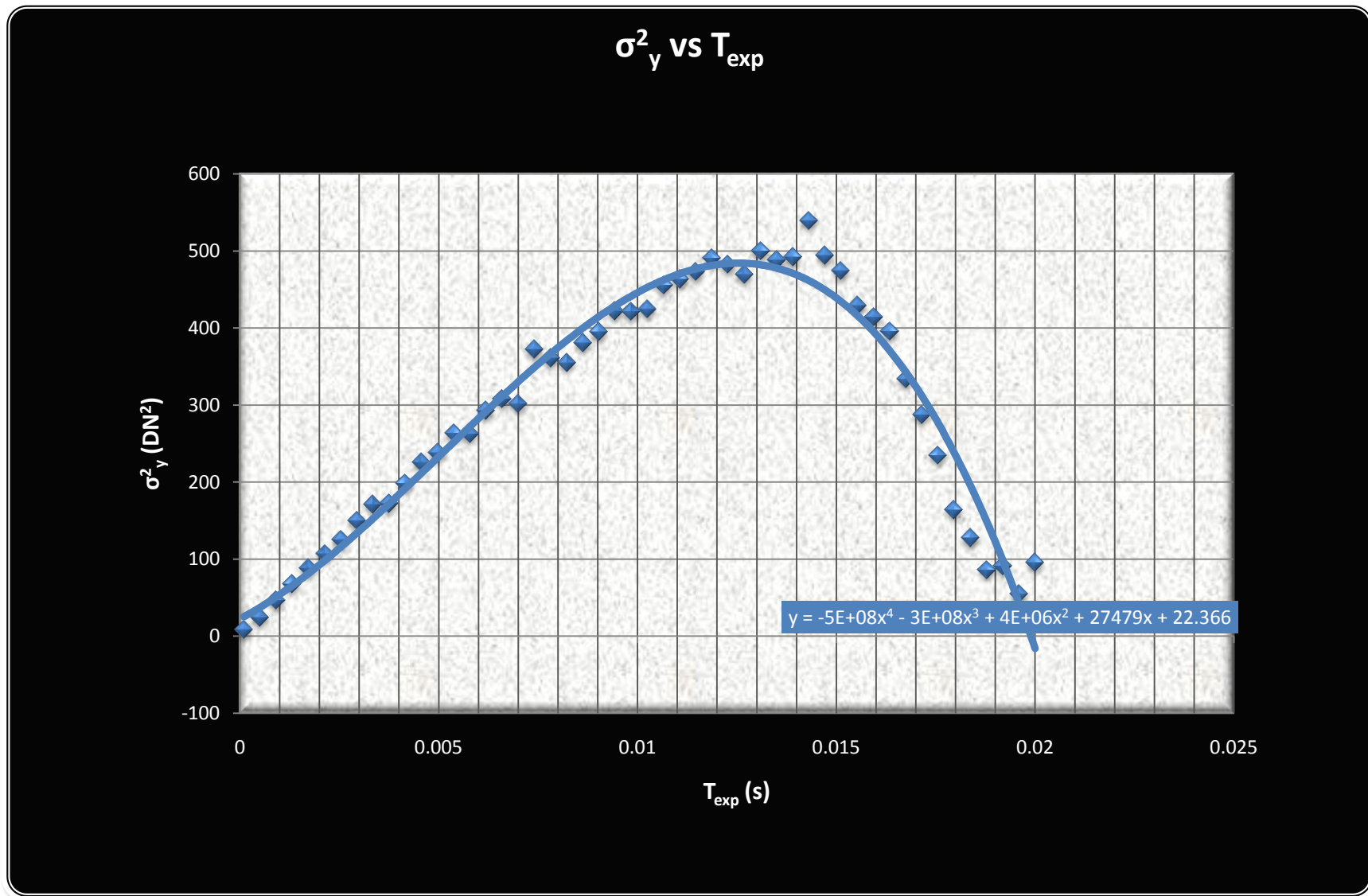


Figure 8: Variance of the gray values' temporal distribution in [DN²] versus exposure time in [s].

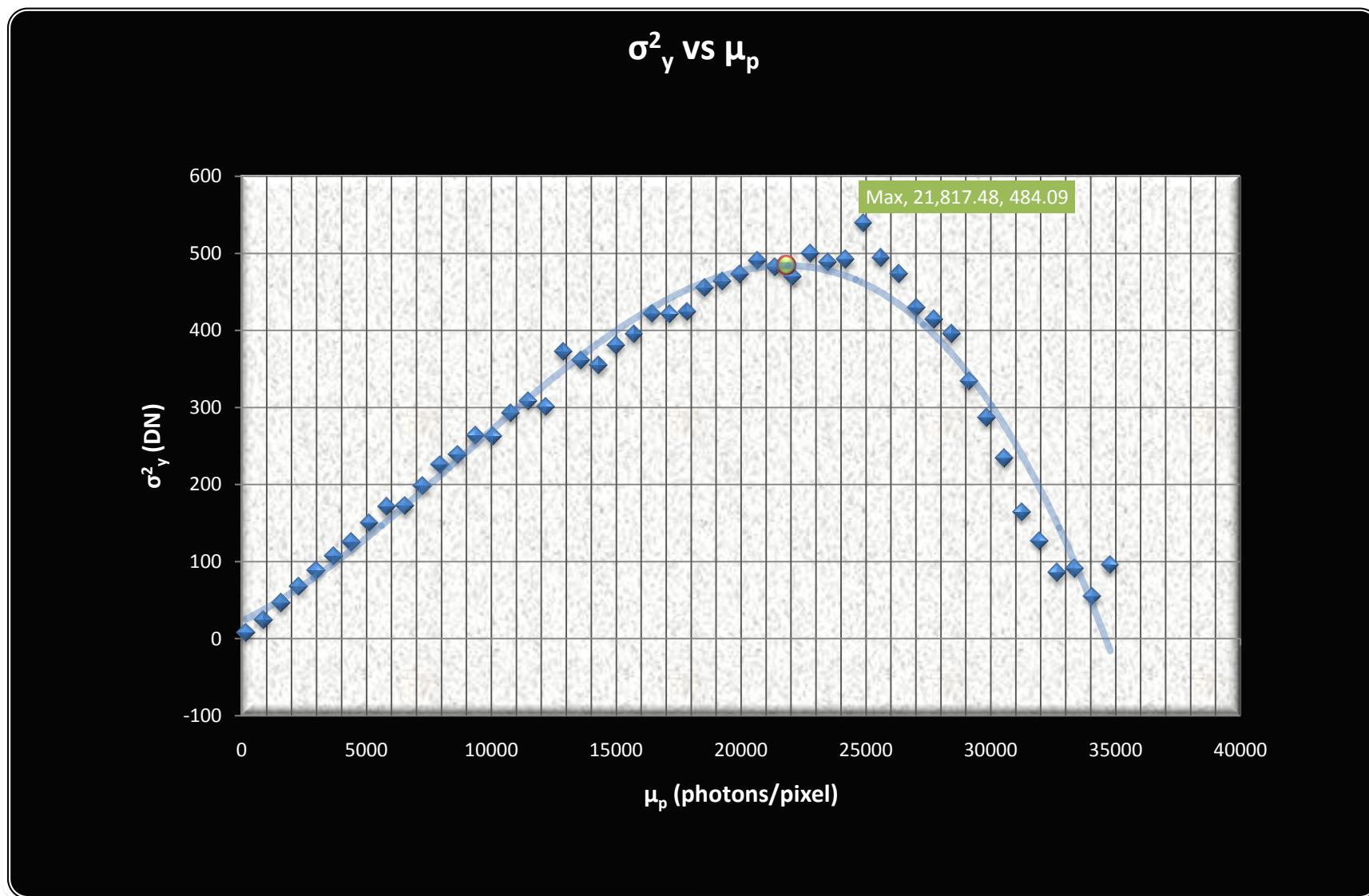


Figure 9: Variance of the temporal distribution of gray values in $[\text{DN}^2]$ versus the number of photons collected in a pixel during exposure time in $[\text{p.}]$.