

Understanding the .lst file

ALV software summary files

- “.lst” files contain summary of entire DLS run
- 1 row per measurement
- Example below shows 4 runs, with a 30 second collection time each

	A	B	C	D	E	F	G	H	I	J	K
1	Time	CR00	CR10	T[K]	Monitor	1.Rad[nm]	2.Rad[nm]	u2	3.Rad[nm]	u2	u3
2	0	6.90E+01	0.00E+00	3.01E+02	2.95E+05	1.52E+02	1.50E+02	2.62E-02	1.49E+02	5.26E-02	5.12E-02
3	31.9	6.90E+01	0.00E+00	3.01E+02	2.95E+05	1.62E+02	1.60E+02	1.68E-02	1.59E+02	4.93E-02	5.87E-02
4	63.8	6.89E+01	0.00E+00	3.01E+02	2.95E+05	1.63E+02	1.63E+02	-8.83E-03	1.62E+02	3.69E-02	8.24E-02
5	95.7	6.81E+01	0.00E+00	3.01E+02	2.95E+05	1.71E+02	1.79E+02	-6.64E-02	1.72E+02	7.45E-02	2.53E-01

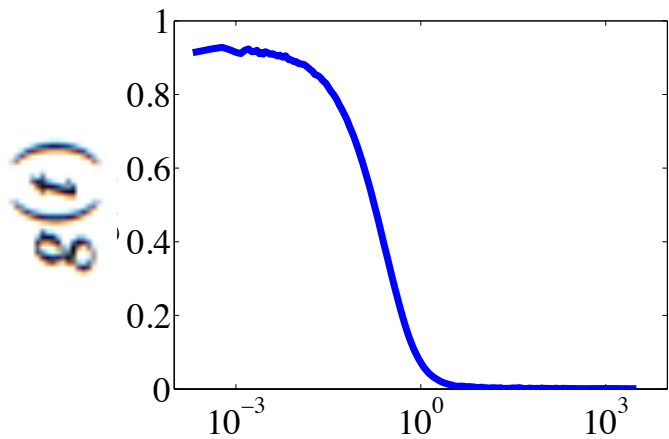
Comparing Scattered Intensity

- Assessing I/I_0 as a function of time in a single sample can identify processes like growth and settling
- Comparing I/I_0 as a function of concentration (using several samples) can identify critical micelle concentration, for example
- I = column B “CR00” & I_0 = column E “Monitor”

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Cumulant Analysis Results

- Instrument provides parametric fits from 1st 2nd and 3rd order cumulant fitting analysis for the raw data correlation functions $g(t)$



Fitted Parameters from Cumulant Analysis

First Order 2nd Order (2 parameters) 3rd order 3 parameters

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Cumulant Fit of Correlation Function $g(t)$

ALV software uses the following conventions, and saves 6 fit parameters in the .lst file:

- First order
– 1 parameter Γ $g(t) = \exp(-\Gamma t)$
- Second order
– 2 parameters Γ, μ_2 $g(t) = \exp(-\Gamma t + \frac{\mu_2}{2} t^2)$
- Third order
– 3 parameters Γ, μ_2, μ_3 $g(t) = \exp(-\Gamma t + \frac{\mu_2}{2} t^2 - \frac{\mu_3}{6} t^3)$
- Polydispersity Index $PDI = \frac{\mu_2}{\Gamma^2}$

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- Can be obtained from 2nd (or 3rd) order cumulant fit parameters given in the .lst file

where $\Gamma = \frac{kT}{6\pi\eta a} q^2$

and η = viscosity, a = radius (column G for 2nd order), Temp is in column D, & $q = 4\pi n \sin(\theta/2) / \lambda$

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