How to use an ELSD

Model 200S

Model 100

INTRODUCING
Model 2300
High Sample Throughput.
Sleek Modern Design.

Model 300S

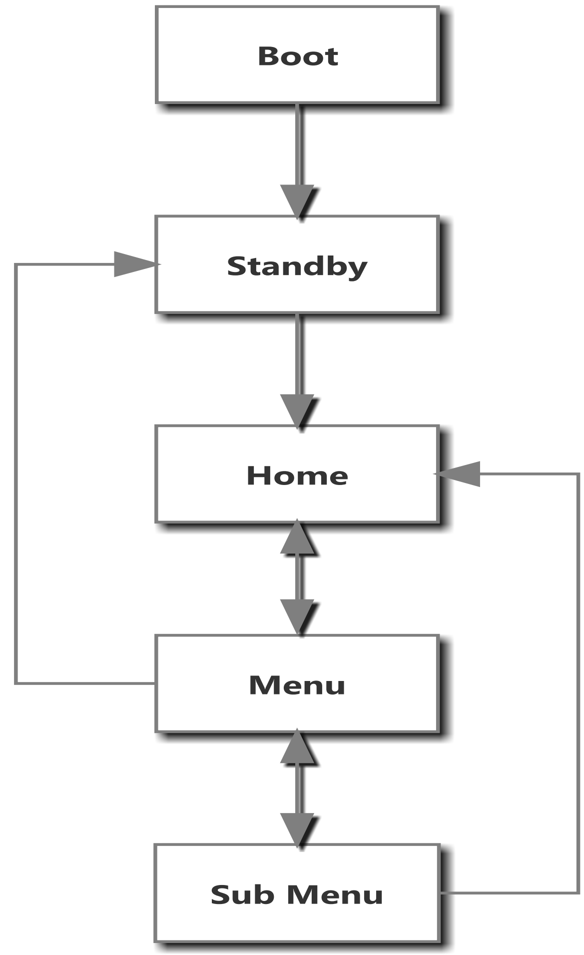
Model 1300

Model 2300 Operation

Controlled via six touch sensitive keys
Hidden behind the molded front

Power
Home
<= Left
=> Right
Enter
Next

Tiered Menu Structure



Model 1300 Operation

- Controlled via six touch sensitive keys

    PWR (power),

    A/Z

    ESC(escape),

    ▲ (up),

    ▼ (down)

    ENT (enter)

- Three Tiered Menu

Model 300S Operation

Only 4 Keys
for Detector Control

Three Tiered Menu

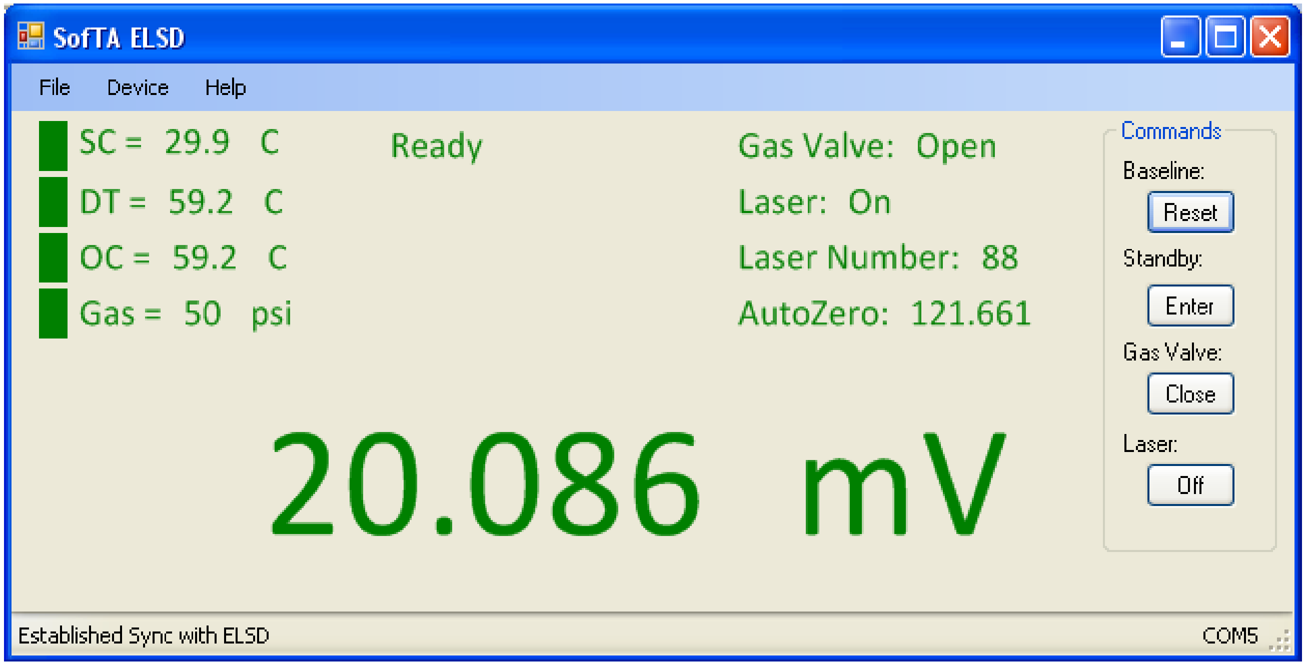
Model 200S Operation

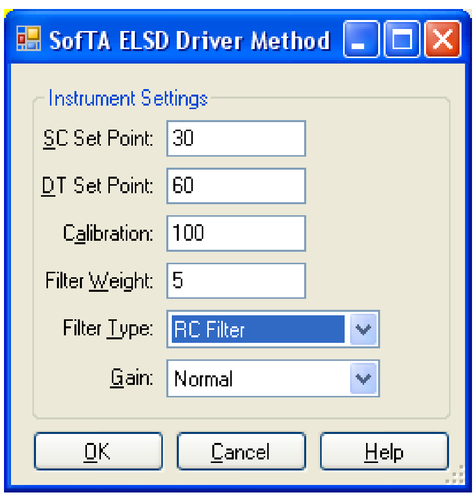
Only 2 Keys for Detector Control

Power Key is used to enter menu

Autozero Key is used to adjust parameters

PC Control Program





USB Connection to ELSD

Success with an ELSD

- Clean Mobile Phase Solvents & Modifiers
- Clean gas
- Free flow of exhaust
- Optimized detector temperatures
- Low mobile phase flow rates

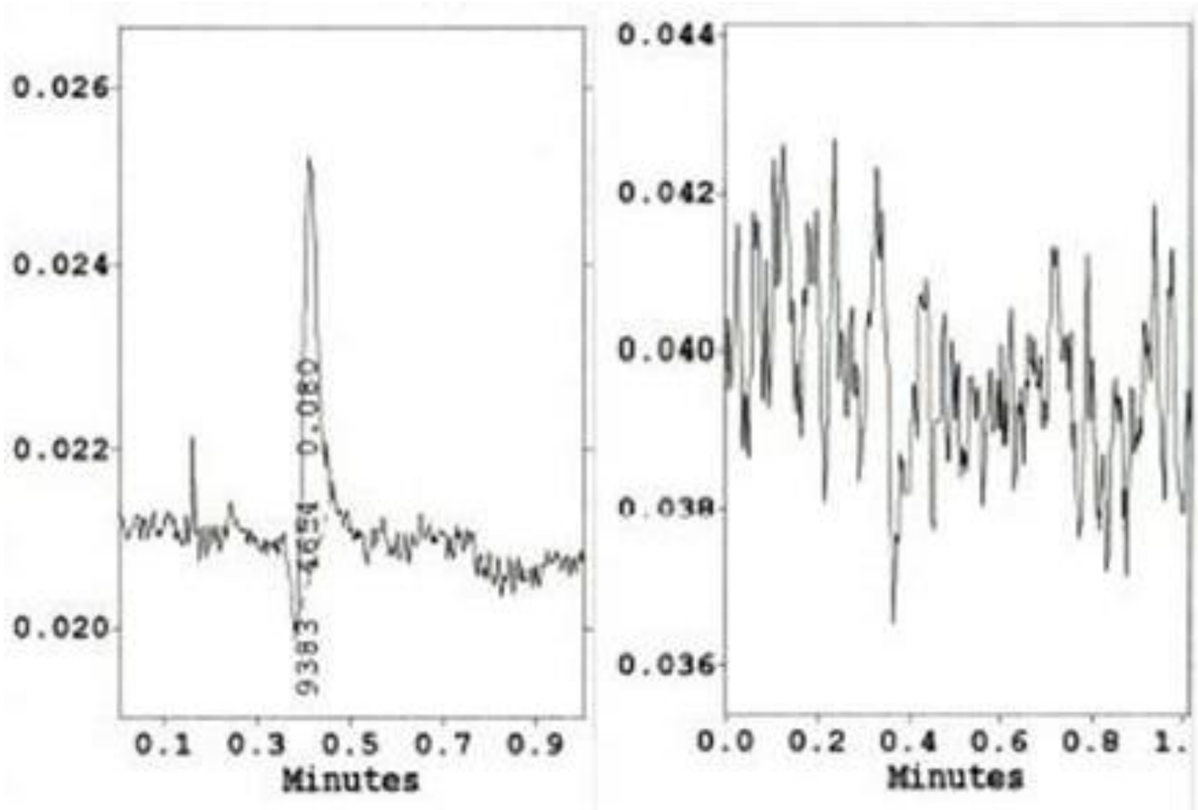
Volatile Mobile Phases

Solvent	Type	% Residue on Evaporation
2-propanol	Reagent Grade	<0.0001
	Spectrophotometric grade	0.0002
Acetonitrile	ACS Grade	<0.001
	HPLC Grade	0.0001
Methanol	Reagent Grade	<0.1
	HPLC Grade	<0.0001
Water	Reagent Grade	<0.1
	HPLC Grade	<0.0001

Solvent Quality Effects Baseline Noise

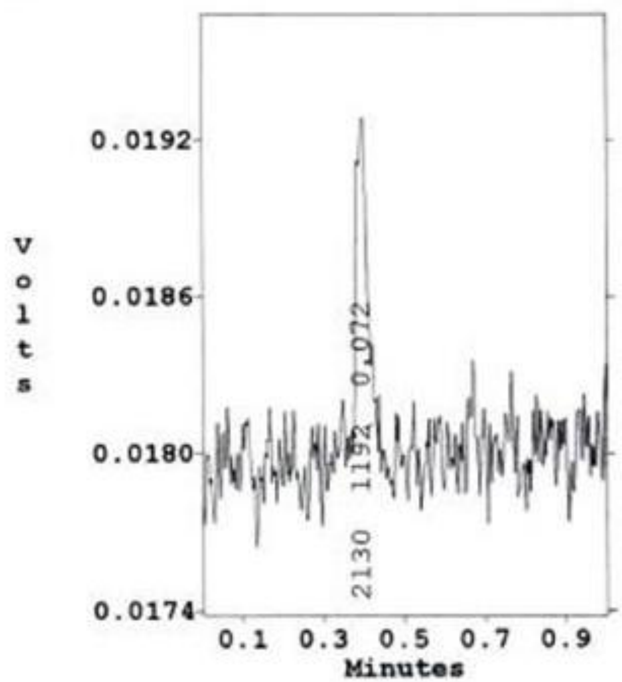
HPLC Grade MEOH

Reagent Grade MEOH

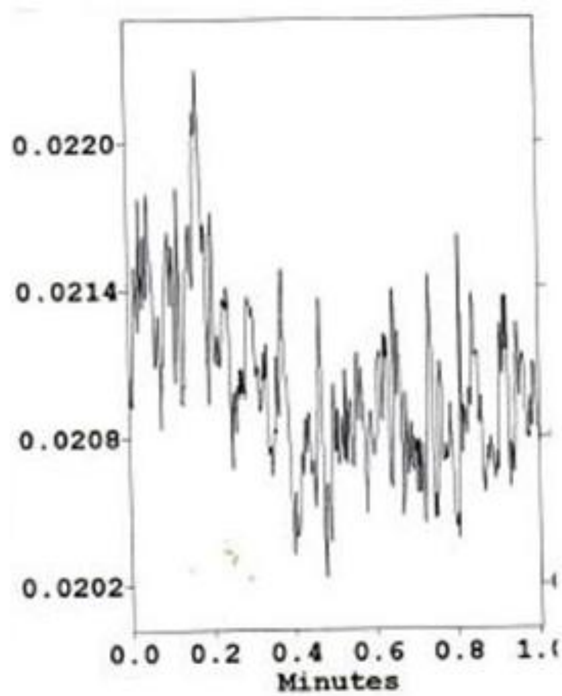


Water Quality Effect on Baseline Noise

HPLC Grade



Reagent Grade



Volatile Buffers

LCMS Grade is best

	Typical Concentration	pH	Buffering Range
Formic Acid	0.1%	2.7	
Acetic Acid	0.1%	3.3	
Trifluoroacetic Acid	0.1%		
Ammonium Formate	5 – 10mM		2.7 – 4.7
Ammonium Acetate	5 – 10mM		3.7 – 5.7
Ammonium Carbonate	5 – 10mM		6.6 – 8.6

Starting up an ELSD

- Unpack the instrument and find a spot on the bench with adequate ventilation
- Plug it in but DO NOT TURN IT ON yet.
- If using the PC Control program, Start Windows on the control computer
- Start the control program for the ELSD
- Turn the ELSD on, and select the Universal method from the front panel.
- Connect the liquid inlet to appropriate spot on the HPLC system.
- Fill the drain with mobile phase
- Connect the exhaust to a vent
- Pump mobile phase for a few minutes to wash out the instrument
- Inject your first peak

ELSD Set Points

Models 1300 and 300S

Universal Conditions	Aqueous Conditions	Organic Conditions
Spray Chamber 30C	Spray Chamber 10C	Spray Chamber 60C
Drift Tube Temperature 60	Drift Tube Temperature 50	Drift Tube Temperature 70
Filter BLT 5	Filter BLT 5	Filter BLT 5

Model 2300

Universal Conditions	Hi FLO Aqueous	Low Flo Organic
Spray Chamber 10C	Spray Chamber 20C	Spray Chamber 55C
Drift Tube Temperature 65	Drift Tube Temperature 85	Drift Tube Temperature 70
Filter FLT 2	Filter FLT 2	Filter FLT 5, Low Gain

Volatiles (with He)
Spray Chamber 10C
Drift Tube Temperature 45
Filter BFT1

When Optimization may be necessary

- The mobile phase may be difficult to evaporate, high aqueous or volatile buffer content or high flow rates
- The required detection limit is low, 100ng or lower
- The analyte is semi-volatile.

Parameters to Adjust

Optimize Conditions for Best Signal to Noise

Spray Chamber Temperature
- Sub ambient for hard to evaporate MP
- Elevated for highly organic MP

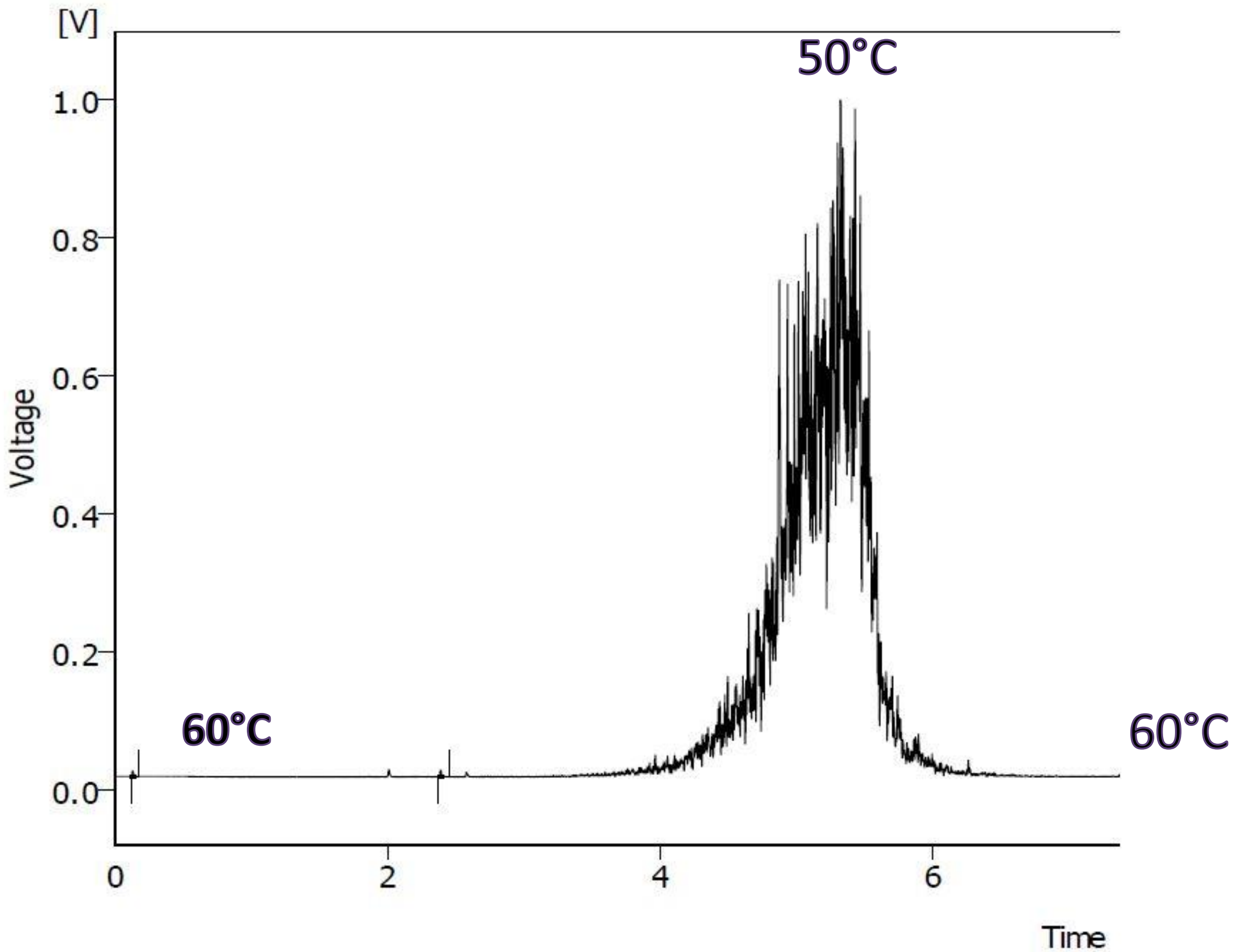
Drift Tube Temperature
- Hot enough to evaporate MP
- Not too hot to volatize analyte

Filter
- Off (or 0) to 10
- Baseline Filter (BLT) vs. RC Filter (FLT)

Gain
- Normal vs EDR (Models 1300, 300S)
- Normal vs. Low (Model 200S and 100, 2300)

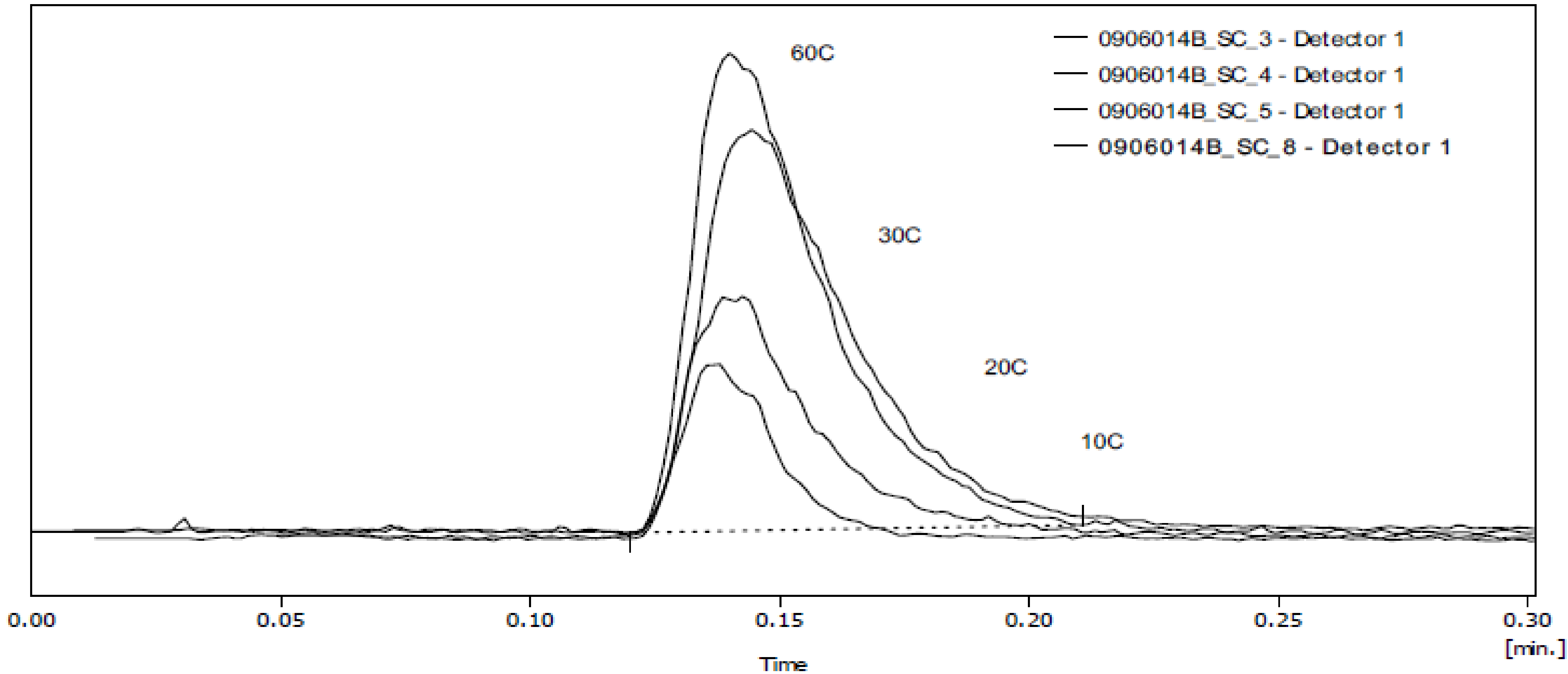
Full Scale
- 2300 and 1300: 1V or 10mV,
- 300S, 200S, 100: 5V or 10mV
- Data systems that require 1V: Change Calibration to 20% at 5V

Drift Tube Temperature Optimization



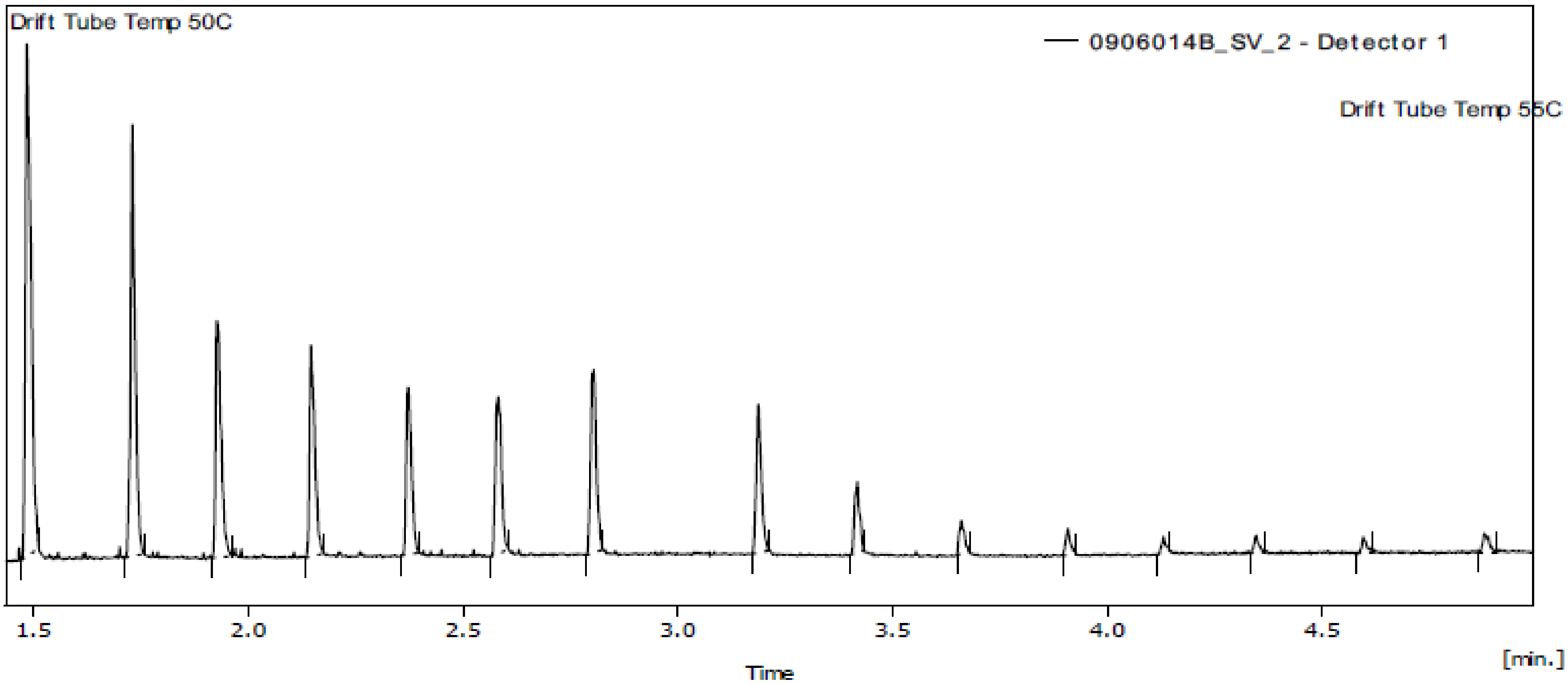
In this example a difficult to evaporate mobile phase was selected, 1ml/min Water. The Spray Chamber was set at 30 and the drift tube was varied. At time 0 the drift tube was 60C. The drift tube cooled to 50C by time 5 and returned to 60 after 6 minutes.

Spray Chamber Temperature Optimization



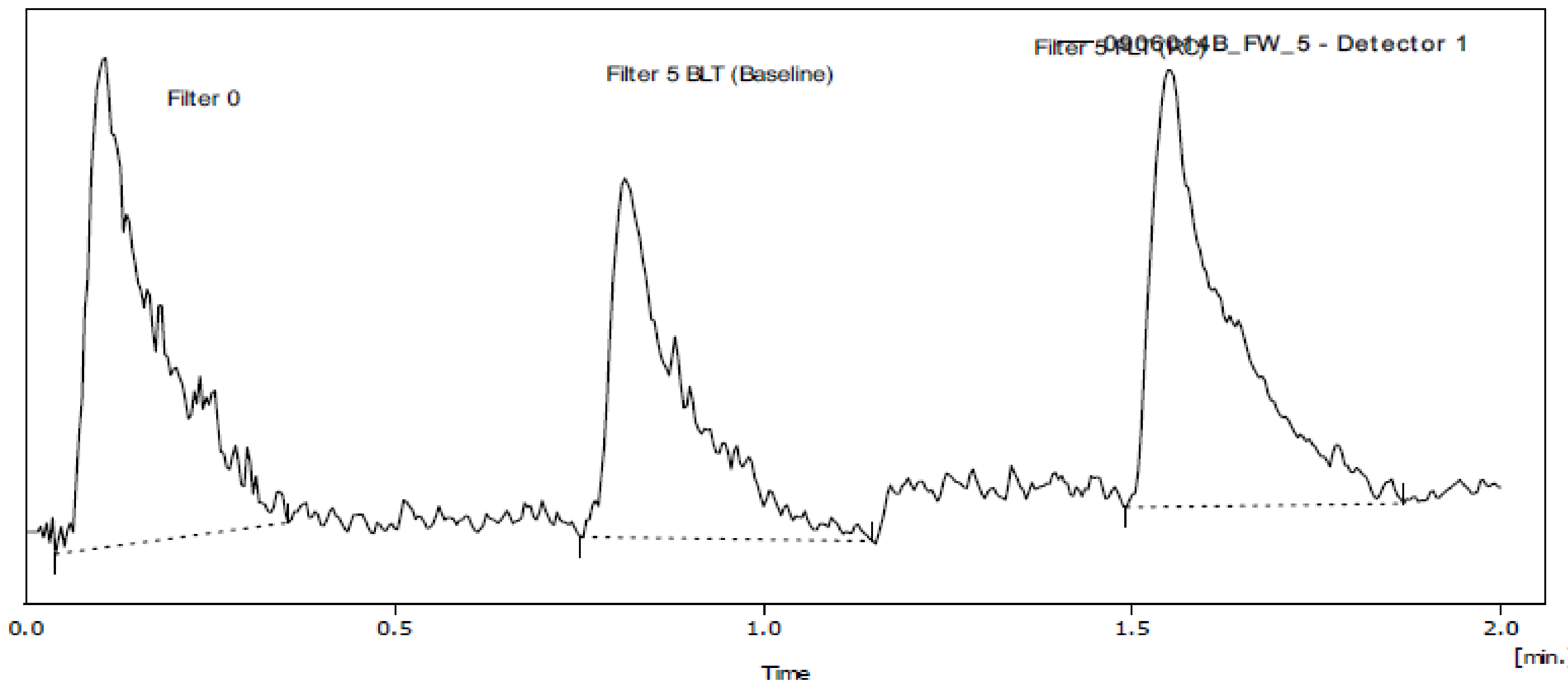
In this example an easy to evaporate mobile phase was selected, 0.5ml/min Methanol. The Drift Tube temperature was held constant at 40C. The Spray chamber temperature was increased from 10C to 60C. You can see the effects of reducing the spray chamber temperature in the image below.

Semi-Volatile Analyte Detection



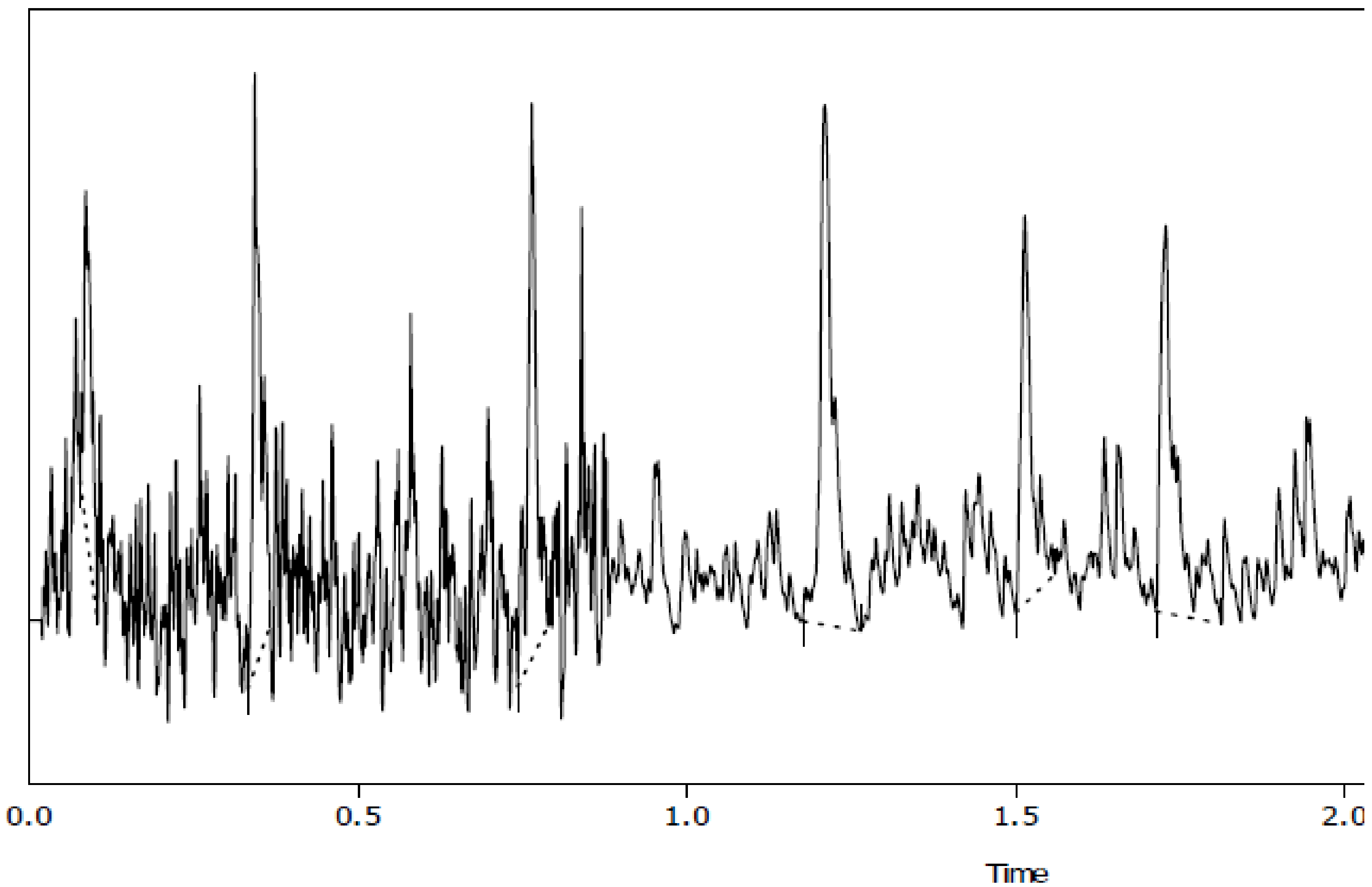
This example show that a small increase in drift tube temperature will decrease the signal of a semi-volatile analyte significantly.

Filter Type



In this example both filter types, Baseline and RC, are compared to no filtering. The mobile phase was 1ml/min water. A length of wide ID tubing was inserted between the injection valve and the detector to simulate broad peaks. The Spray Chamber and Drift Tube temperatures were selected to provide significant noise for the example, SC 30, DT 56.

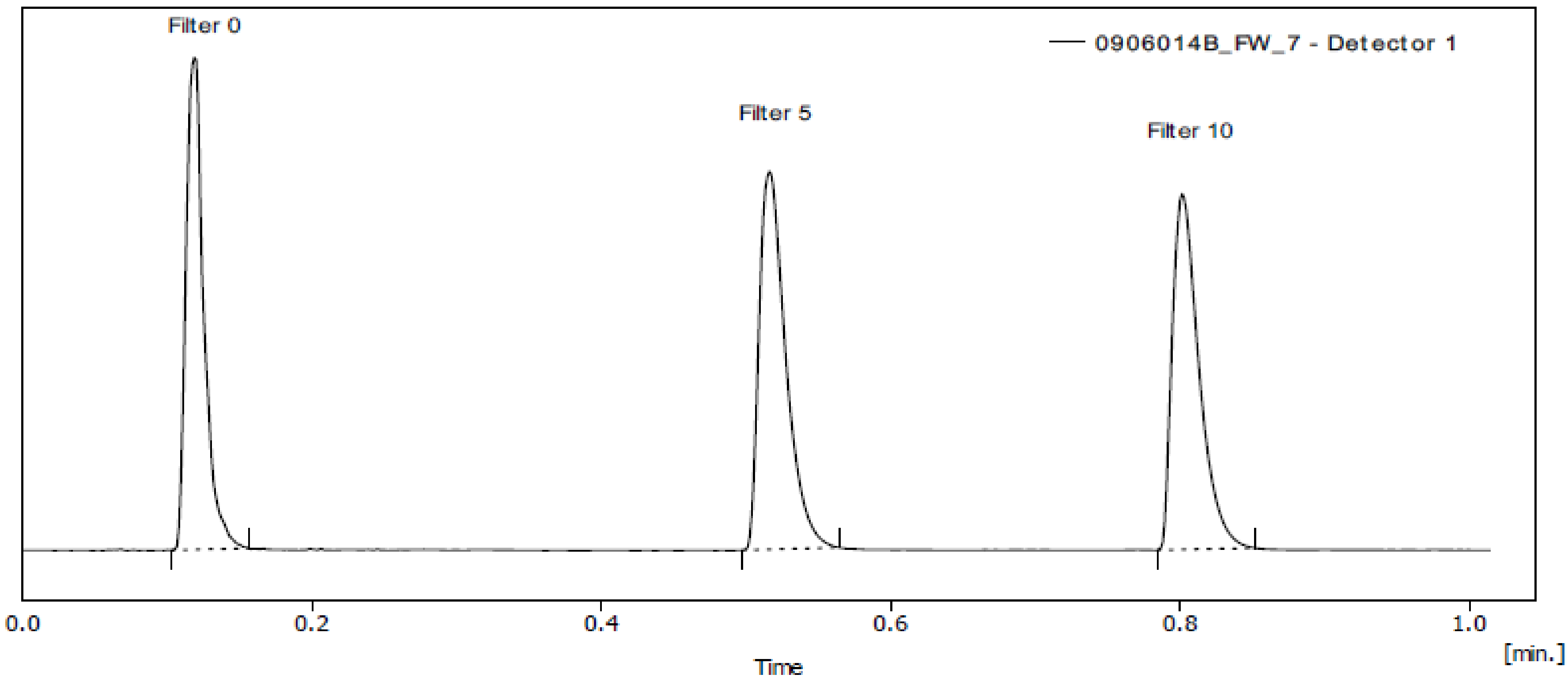
Filter Weight



In these example the affect of the filter weight for both types is shown. Again, the Spray Chamber and Drift Tube temperatures, SC 30, DT 53, were deliberately selected to provide significant noise for the example. The mobile phase was 1ml/min water. The analyte was 100ng NaBenzoate.

This example shows the Baseline filter at filter 0 and 5

Affect of filter weight on the RC or FLT Filter type.



This example shows that while a larger filter filter weight with RC filter type decrease the noise it also broadens and decreases the peak heights.

Spray Chamber and Drift Tube temperatures, SC 30, DT 53, mobile phase was 1ml/min water analyte 1000ng NaBenzoate.