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# Full integration of LDTD on the Waters Xevo Family

*Pierre Picard[1], Serge Auger[1] and Patrice Tremblay[1]*
*[1]Phytronix Technologies, Quebec, Canada*

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## Introduction

The LDTD ion source uses an infrared laser diode to desorb samples that have been dried onto a 96-well LazWell™ plate. The rapid desorption produces neutral ion species which are carried into a corona discharge region to undergo efficient protonation and are subsequently transferred directly into the mass spectrometer for detection.

The LDTD technology is now fully integrated in both software and hardware into the Waters Xevo MS Family.

## LDTD Hardware integration

- The Phytronix Technologies LDTD ion source, model WX-960 / WX-3840 (**Figure 1**) is designed to mimic the Xevo ion source interface in order to achieve plug-and-play device compatibility. Moreover, the LDTD is easily interfaced with the triple-quadrupole Xevo TQMS (**Figure 2**) as well as the high resolution Xevo G2 QTof (**Figure 3**) without any major modifications to the MS.

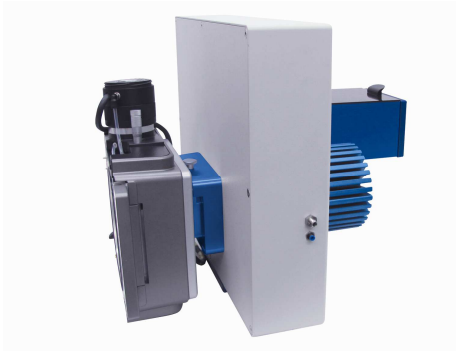

**Figure 1**: LDTD ions source model WX-960 /WX-3840.


**Figure 2:** LDTD system on Xevo-TQMS mass spectrometer.

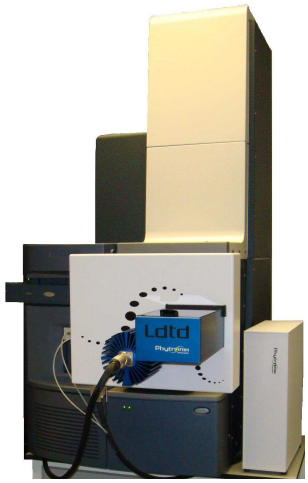


**Figure 3:** LDTD system on Xevo-G2 QTof mass spectrometer.

## LDTD Software integration

The LDTD is operated directly from your MassLynx™ mass spectrometer software. During configuration, set the LDTD ion source just as you would any other inlet method (**Figure 4**) and run your samples. It's as simple as that! You don't need to learn new software or concern yourself with data transfers. You simply build a batch sequence as usual and run your samples with the LDTD ion source attached to your mass spectrometer. With the LDTD ion source, you can run multiple MS methods and multiple laser conditions within the same sample batch sequence.

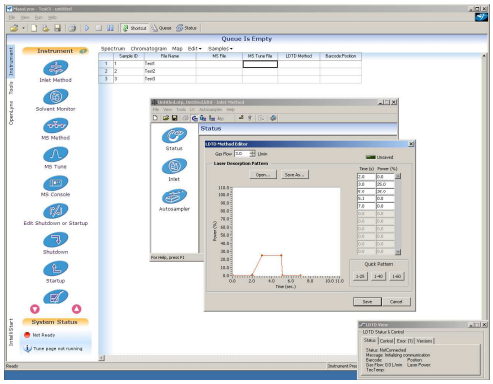

**Fig. 4** LDTD system on Xevo-G2 QTof mass spectrometer.

## Results and Discussion

### Linearity result on LDTD-Xevo-G2 QTof system.

With the High Resolution Xevo-G2 QTof, you eliminate the compound optimization step as you only need to set the ionization mode and the mass range to scan. The linearity has been evaluated by running plasma samples spiked with Dextrorphan. The proteins were crashed with Acetonitrile and the linearity evaluated from 10 to 100,000 ng/mL in Extended Dynamic Range mode. As shown on **Figure 5** the linearity is excellent ($r^2$ > 0.99) with no signs of a carryover effect.

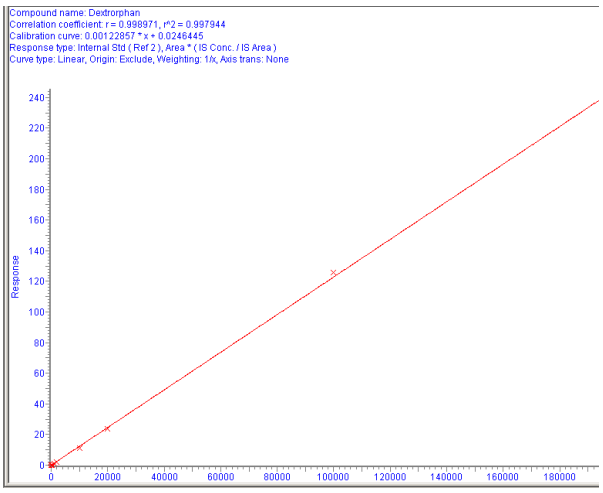


**Figure 5:** Standard curve of Dextrorphan on LDTD-Xevo-G2 MS.

### Linearity result on LDTD-Xevo-TQMS system

Signal linearity has also been evaluated on the LDTD-Xevo-TQMS system. The linearity has been determined by running plasma samples spiked with Clomiphene. The proteins were precipitated with Acetonitrile and the linearity evaluated from 1 to 1000 ng/mL. As shown on **Figure 6** the linearity is excellent ($r^2$ > 0.99) over the calibration range and no carryover was observed.

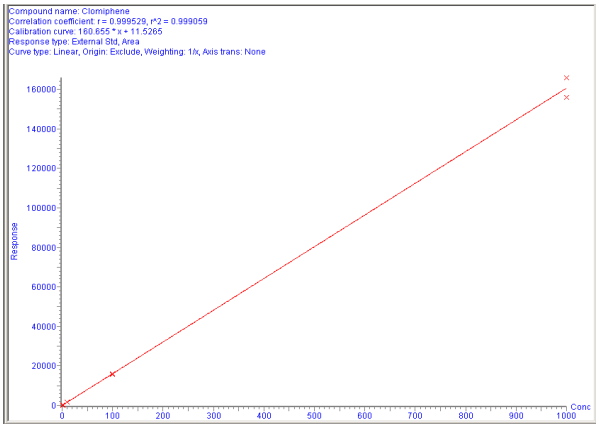


**Figure 6** Standard curve of Clomiphene on LDTD-Xevo-TQMS

## Conclusions

LDTD technology is completely integrated into the Waters Xevo MS product line (software and hardware) without additional software or file exportation needed.

The combination of LDTD to the Xevo-G2 QTof system allows the user to run a fast generic method without the need for compound tuning (exact mass with a window range) and reduces sample analysis to a mere 10 sec/sample runtime. Screening analysis can be performed with a fast extraction, no MS optimization and a rapid sample runtime of mere seconds.

On the LDTD-Xevo-TQMS system, high-throughput analytical performance can be realized, using similar methods to a classic quadrupole system, but with sample analysis speed measured in seconds.



 