

**IMPROVING THE TRANSMISSION OF IONS THROUGH A HIGH-PRESSURE
QUADRUPOLE COLLISION CELL**

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RF-only quadrupole collision cells operating at high pressure (>1 mTorr) were shown to improve the ion transmission efficiency and consequently improve detection limits of LC-MSMS. The high transmission efficiency arises from collisional focusing effects which results in ion transit times to be sufficiently long (several milliseconds) that hysteresis effects are observed. This hysteresis effect in multiple reaction monitoring (MRM) results in a false signal contribution when common fragment ions are monitored, a phenomena often referred to as crosstalk.

In precursor ion experiments where the first mass filter is scanned, the hysteresis effect produces tailing on the high mass end of a mass peak. Although the hysteresis effect can be eliminated by introducing a pause time between MRMs or by decreasing the scan speed for precursor scan, under chromatographic conditions it is often undesired to decrease the data sampling rate. In order to eliminate this hysteresis effect, a high pressure collision cell with an axial field along the ion transmission axis was built to reduce ion transit time (< 1 millisecond).