

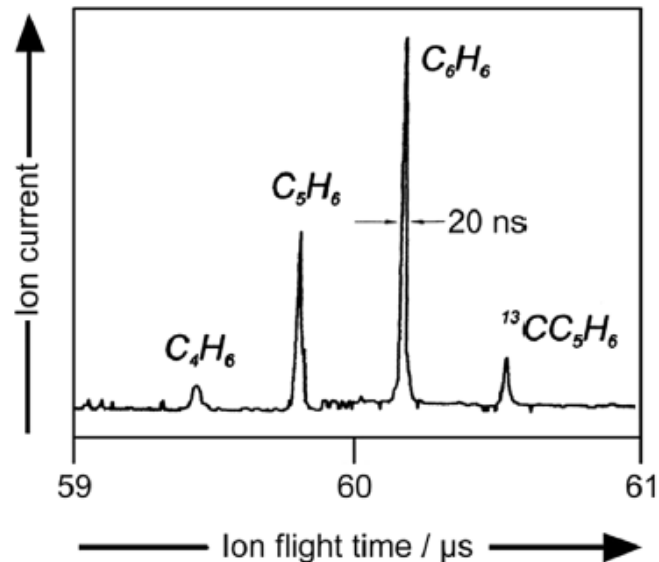
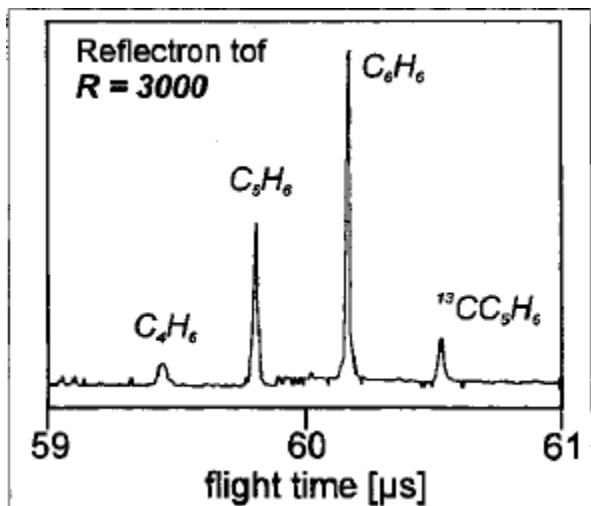
HIGH SPEED TRANSIMPEDANCE AMPLIFIER FOR TIME-OF-FLIGHT MASS SPECTROMETRY

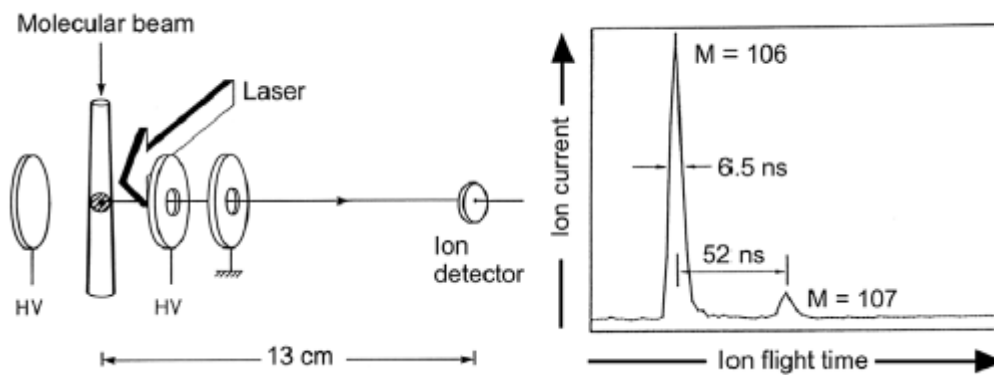
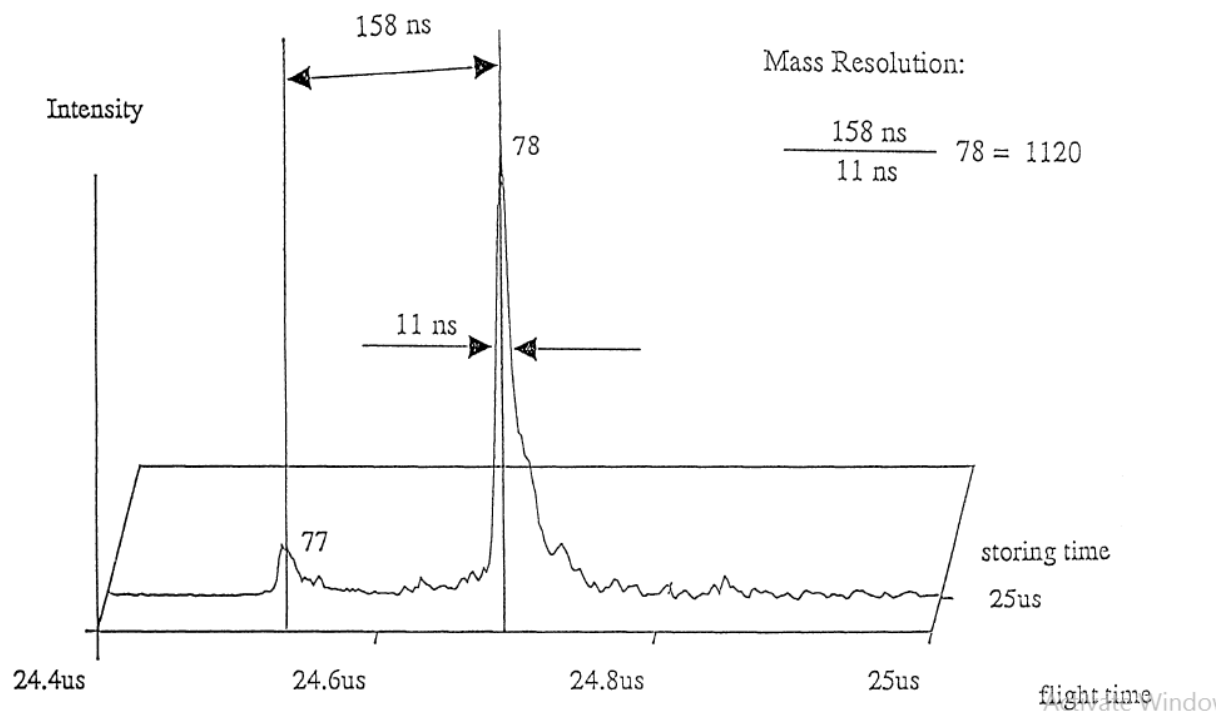
Brief Introduction to Time-of-Flight Mass Spectrometry:

ToF-MS is an analytical instrument used to identify trace gases in a given sample. It has the following sections:

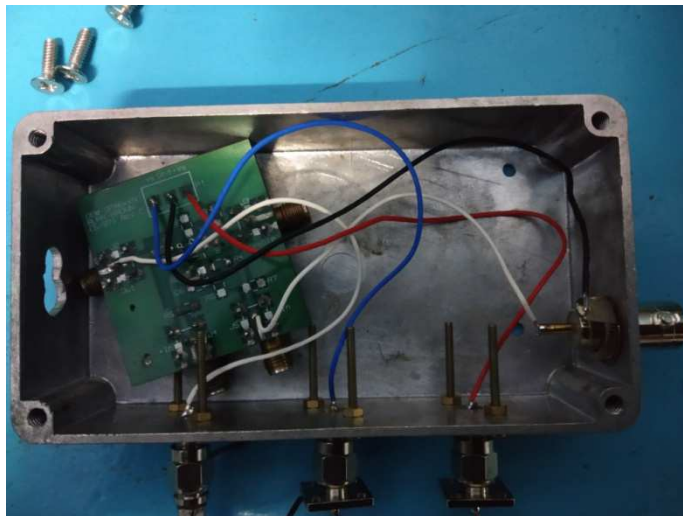
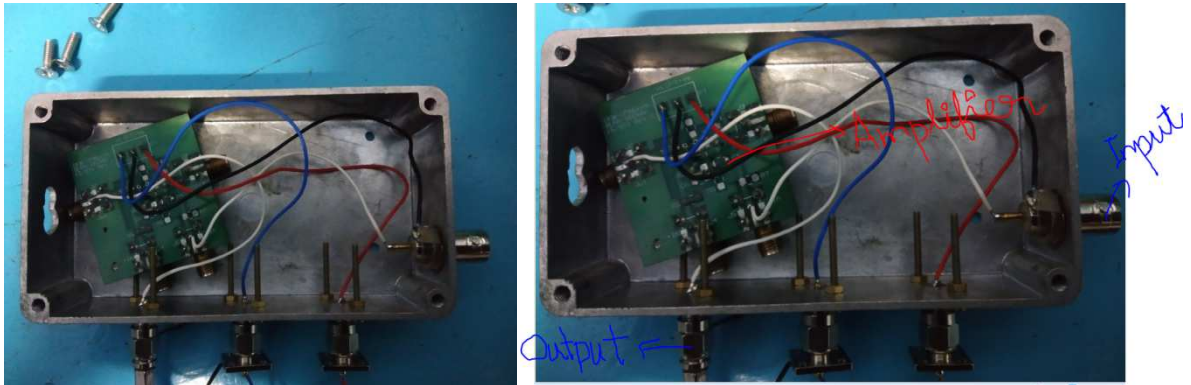
1. Sample inlet system – where samples (a chemical compound to be identified) are inserted
 2. Vaporization/Ionization – here sample is vaporized, ionized and are accelerated by a high voltage signal
 3. Ions with different masses travel at different speeds and reach the detector plate at different times (with this signature compounds are identified)
- When the ions hit the detector plate it generates very small current. Hence a micro channel plate is used (which multiplies the current by a factor of 10^6 . i.e., gain).
 - Even after this the magnitude of the current is about 1 to 5pA (Pico amperes) varying at a rate of about 300MHz.
 - **The job is to design a transimpedance amplifier (TIA) to amplify this small signal. Enough to display the signal with a DSO. I attach a sample waveform of a compound (see fig.). Important parameters to consider are the transimpedance gain, bandwidth and transient performance and more importantly the noise performance.**
 - **TIA with various opamps (eg. OPA656, OPA857, OPA868, LTC6268) should be designed and performance of the above said parameters should be compared.**

Sample DSO waveforms





What we have done?



My Requirement:

As I discussed over the phone: I want to get involved in the process. So, I want guidance and fabrication support.

Note: I've attached some relevant technical documents for your kind reference.

Regards
M Arivalagan
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