

## Supporting information for publication

# Parallel detection of fundamental and 6<sup>th</sup> harmonic signals using ICR cell with dipole and 6<sup>th</sup> harmonic detectors

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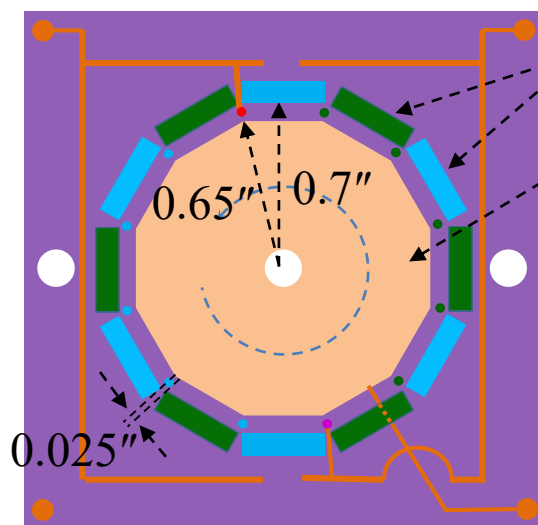
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a)

## Entrance lens plate

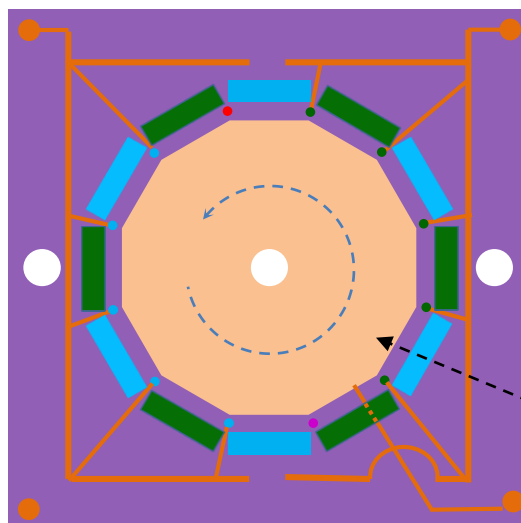


Detection plates

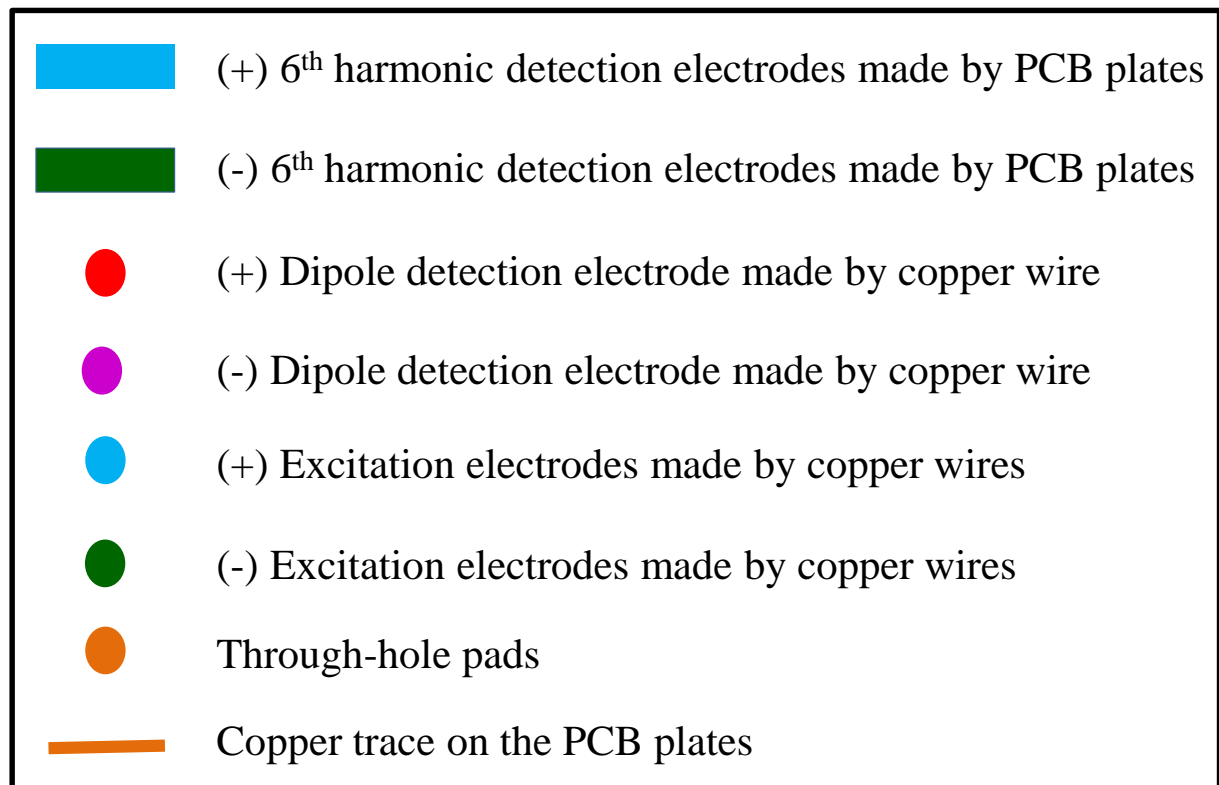
Entrance lens electrodes

## Exit lens plate

b)



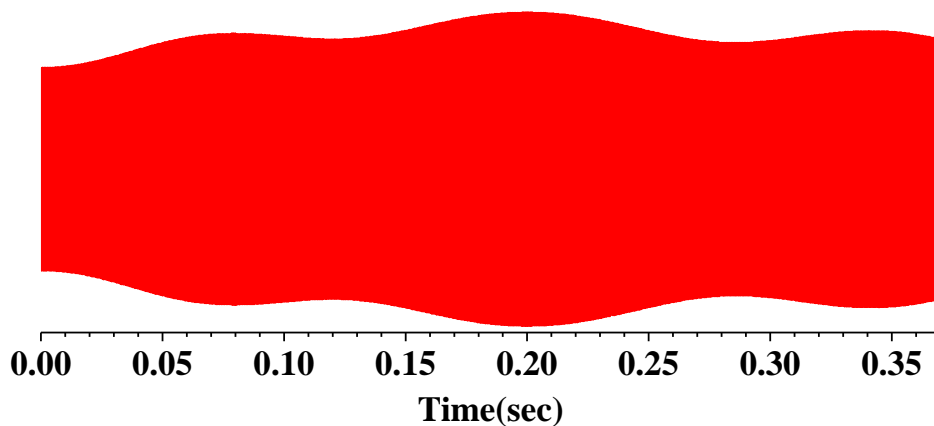
Exit lens electrodes



**Figure S1.** Schematic diagram for entrance (a) and exit (b) lens plate with parallel dipole, 6<sup>th</sup> harmonic detector and excitation electrodes.

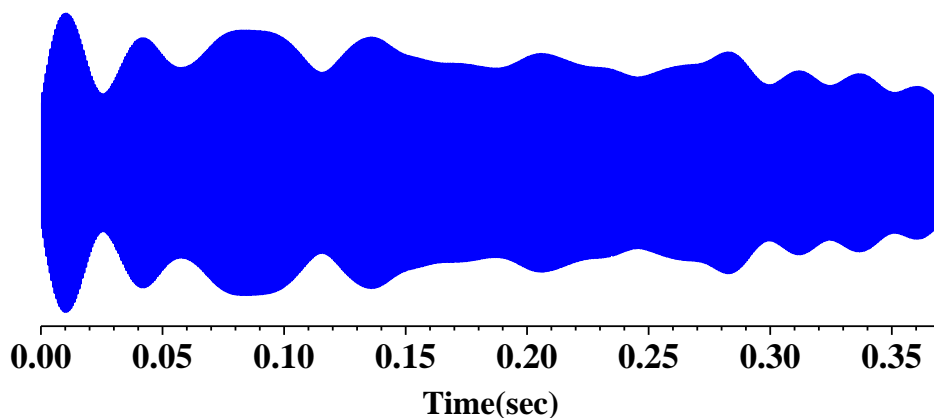
a)

dipole  
detector

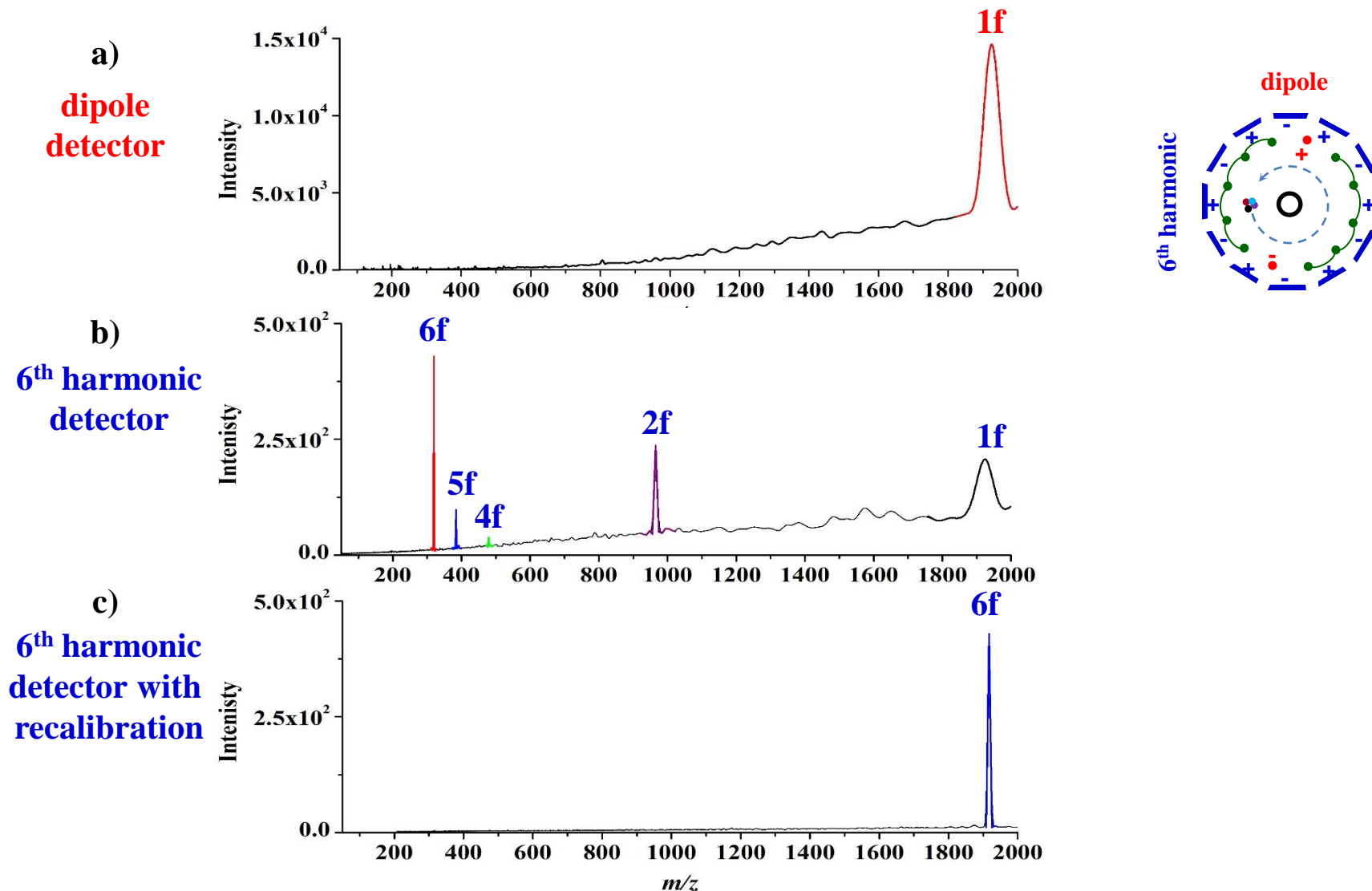


b)

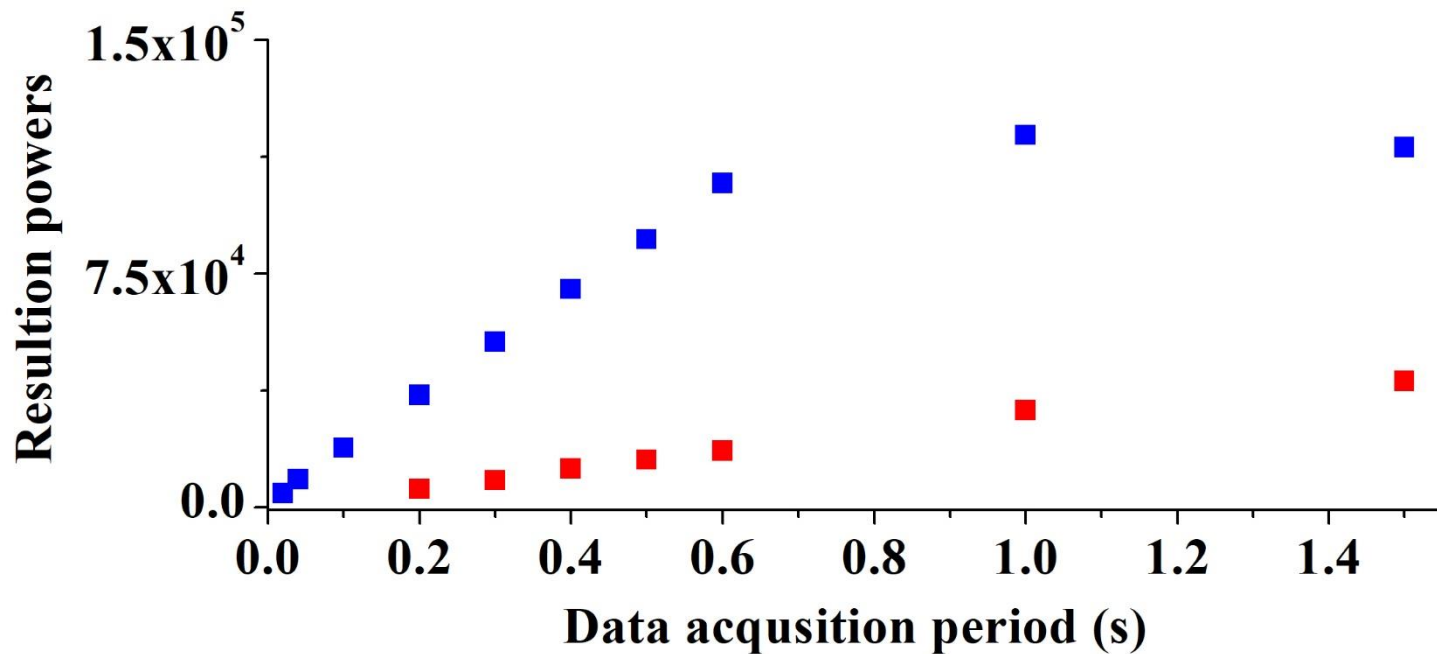
6<sup>th</sup> harmonic  
detector



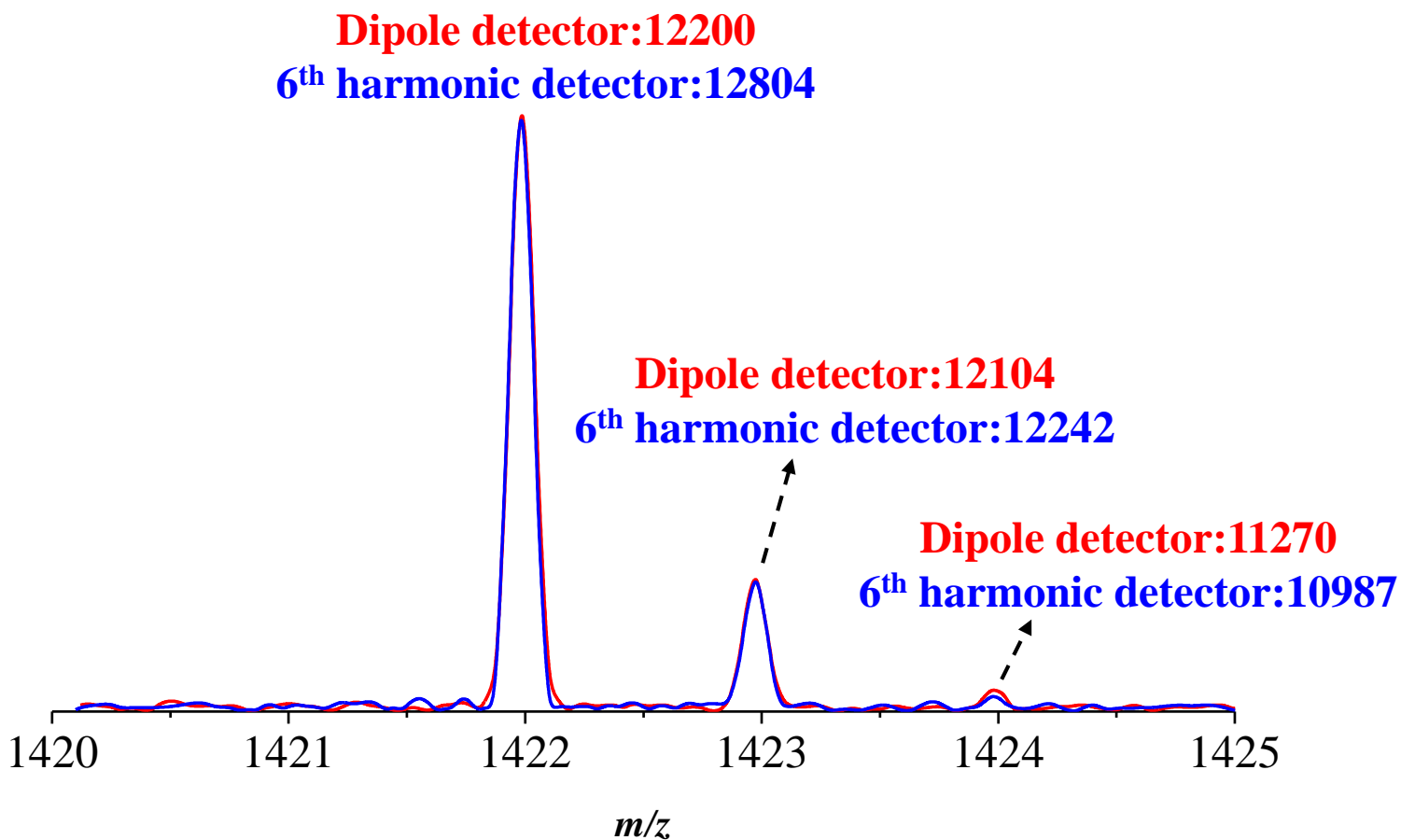
**Figure S2.** Parallel time domain signals of the selected Ultramark 1621 ion (a) at  $m/z$  1422 (fundamental signal from a dipole detector) and ion (b) at  $m/z$  237 (6<sup>th</sup> harmonic signal from a 6<sup>th</sup> harmonic detector) with excitation at 28V<sub>pp</sub>.



**Figure S3.** Mass spectra obtained from parallel dipole and 6<sup>th</sup> harmonic detectors in a single ICR cell with excitation at 28Vpp using insulin. Fundamental signals (a) from a dipole detector. Harmonic signals from a 6<sup>th</sup> harmonic detector before (b) and after (c) recalibration.



**Figure S4.** Resolving powers of +3 charged insulin ion as a function of data acquisition periods. **Blue** square is 6f obtained from a 6<sup>th</sup> harmonic detector. **Red** square is 1f obtained from a dipole detector.



**Figure S5.** Mass spectra of Ultramark 1621 ions obtained with dipole (red) and 6<sup>th</sup> harmonic (blue) detectors during 300ms and 40ms of data acquisition periods, respectively.