Supplement

Fig. S1: Complete background subtracted scan in negative ion mode on 3 February, 2014 at 4:00am local time. Of the five analyzed ions measured, m/z 42 (organic nitrogen species), m/z 59 (acetate) and m/z 89 (hydrogen oxalate) were measured. While chloride and bisulfate were not measured at this particular scan, chloride (m/z 35 and 37) was additionally selected to be analyzed to determine potential influence of marine air on particle composition. Bisulfate (m/z 97) was also chosen for analysis as a clearer marker from anthropogenic influence.
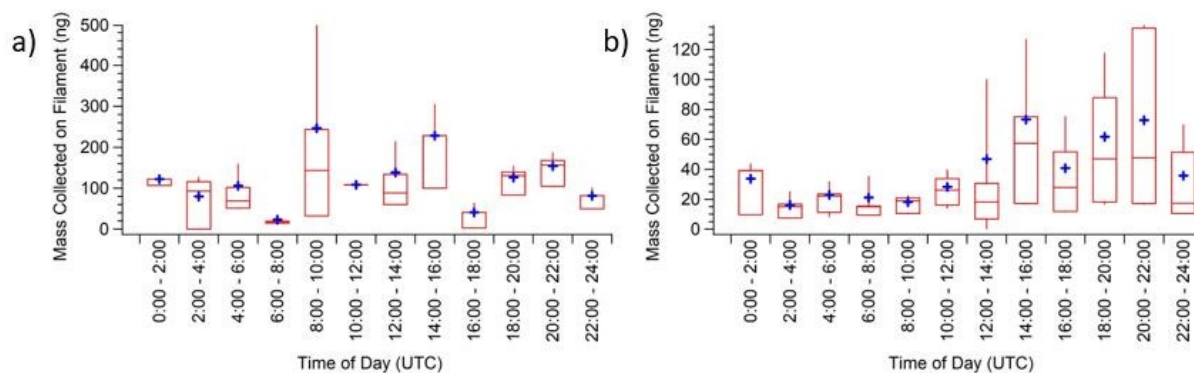
Fig. S2: Diurnal patterns of the estimated mass collected on the TDCIMS Pt filament during collection. a) Anthropogenic period: maintained a relatively consistent mass collected with no observable diurnal trend. b) background period: peaks in collected mass are observed in mid-afternoon and is generally at least half the mass collected during the anthropogenic period. The blue cross is the average value, the box plot represent 25 and 75 percentile and whiskers give max and min values.
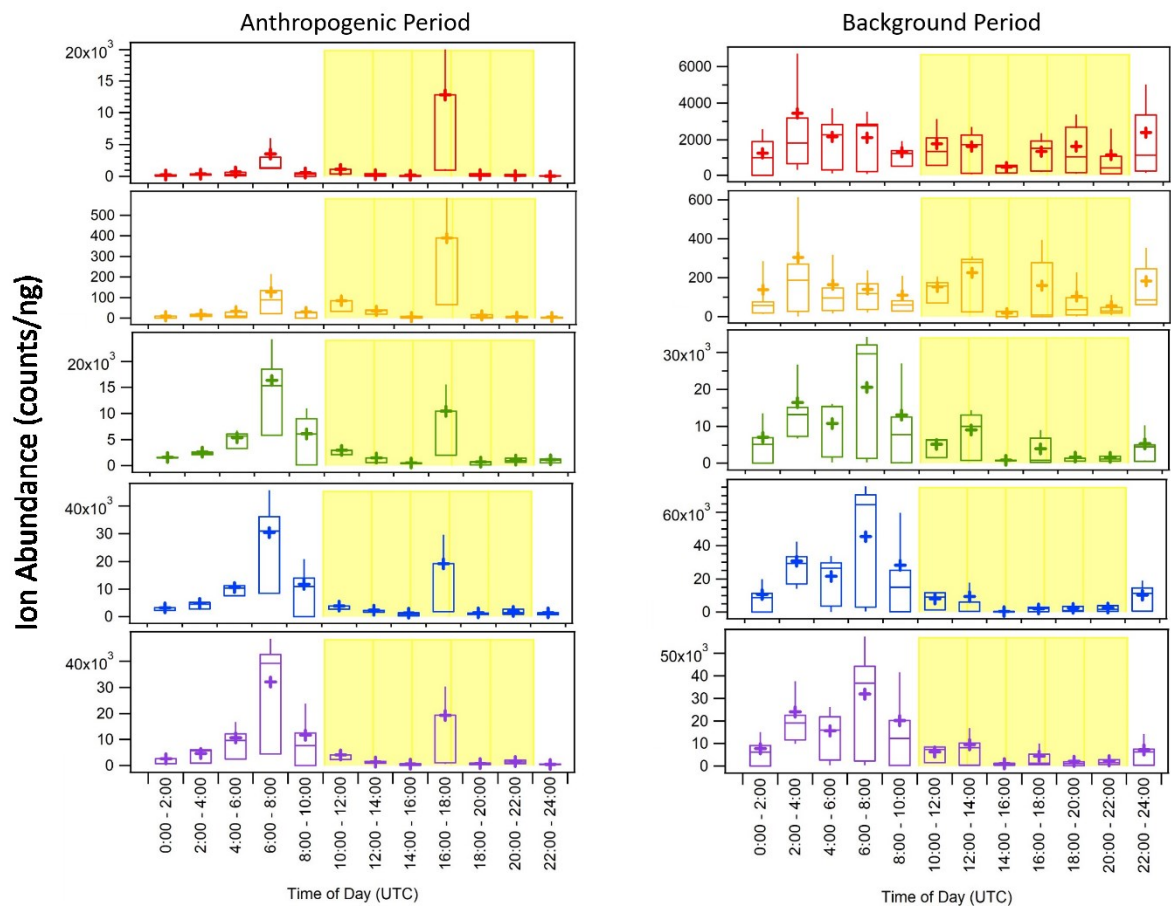
Fig. S3: Diurnal patterns for both anthropogenic and background periods of mass normalized ion abundances. Peaks at similar times were observed for all species, from 6:00-8:00 and 16:00 to 18:00 for the anthropogenic time and from 6:00-8:00 for the background period.
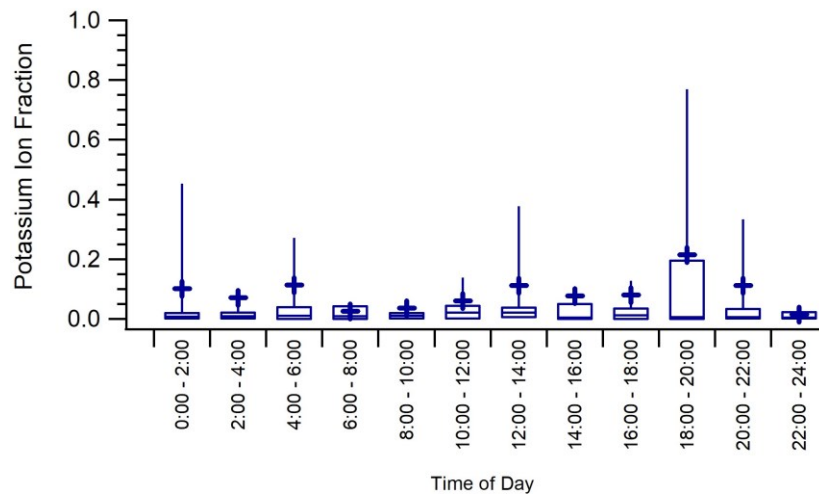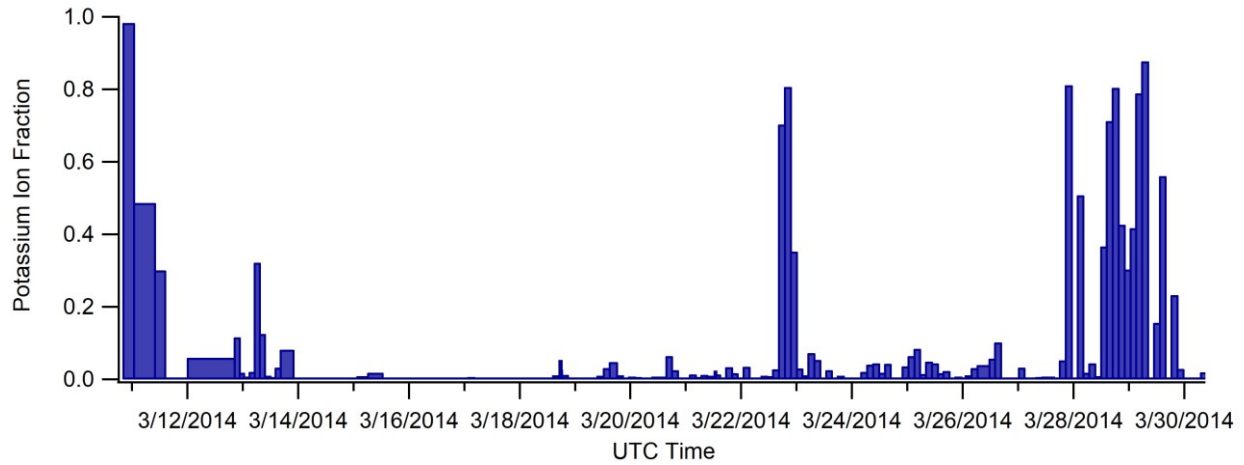
Fig. S4: Potassium ion fraction for all of IOP1 and diurnal pattern for ion fraction. Of 163 measurements during this twenty-day period of measurements, roughly 14% of measurements had a potassium ion fraction greater than 0.1. Also, roughly 12% of measurements had no measureable amount of potassium.