**General story for figure 3:**

* Local changes to z cause a local change in volume and impermeant anion concentration
* Resulting proportional change in membrane potential and chloride reversal potential
* Sets up a situation of chloride microdomains. All with different concentrations but similar chloride driving force.
* The stability in this system is provided by the ATP pumps
* Difficulty in explaining why the membrane potential changes with z are not linear, but rather exponential.
* A screenshot of a computer

  Description automatically generated with low confidenceDifficulty in explaining stability that occurs in z=-0.1 which contradicts the general theme

# Figure 3 part 1 – Multi z

Chart, line chart

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**Figure 3a – local impermeant anion charge sets compartment volume and local impermeant anion concentration.**

*Top row:* The charge of existing impermeant anion species in compartment 8 was manipulated from z=-0.85 (default) to z = -0.1; -0.5; -1.2; -1.6 respectively between 180s to 240s. Altered charge of impermeant anions resulted in a proportional compartmental volume change (and subsequent inverse impermeant anion concentration change). These changes persisted for the remainder of the simulation.

*Bottom rows:* There was no impermeant anion manipulation in compartment 4. Temporary changes can be seen to compartment volume and impermeant anion concentration during the manipulation period in compartment 8, however they return to baseline.

A picture containing window, shoji, building

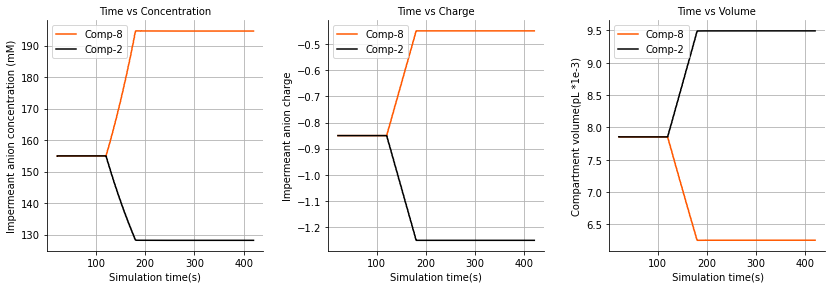
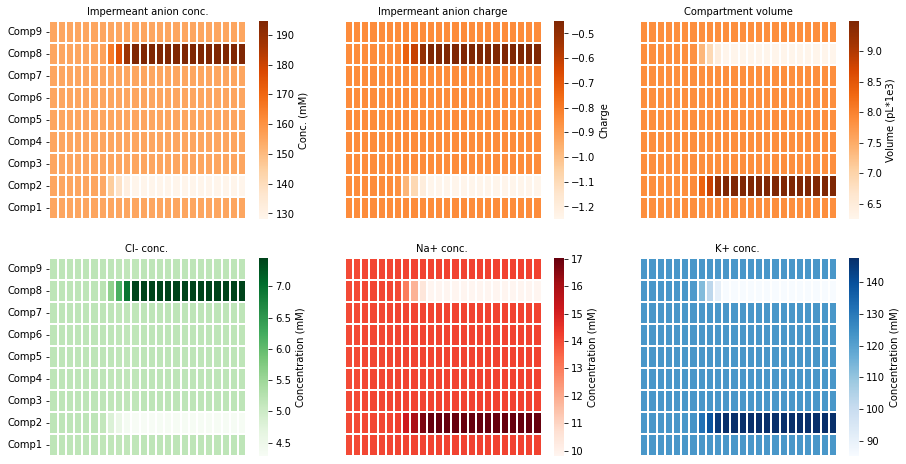
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**Figure 3b – local impermeant anion charge sets membrane potential and chloride reversal potential without changing chloride driving force**

*Top row:* The charge of existing impermeant anion species in compartment 8 was manipulated from z=-0.85 (default) to z = -0.1; -0.5; -1.2; -1.6 respectively between 180s to 240s. Reduction of charge of impermeants decreases the local membrane potential and chloride reversal potential proportionally such that chloride driving forces are not drastically altered.

*Middle and bottom rows:* There was no impermeant anion manipulation in either compartment 4 or the soma. No permanent changes are seen in the membrane potential, chloride reversal potential or chloride driving force.

# Figure 3 part 2 – changing z in 2 compartments



A picture containing window, shoji, red

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