* ~~grade HW6~~
* ~~grade HW7~~
* ~~grade HW8~~
* ~~grade HW9~~
* ~~enroll in winter courses~~
* ~~ensure loans are paused~~
* ~~run grace runs~~
  + ~~crex~~
    - ~~make crex input~~
      * ~~get activity on that day~~
    - ~~do crex initial conditions~~
    - ~~run crex run~~
    - ~~make plots~~
  + ~~lamp~~
    - ~~make lamp input~~
      * ~~get activity on that day~~
    - ~~fix grid (higher density near center, even more coarse near edges~~
    - ~~do lamp initial conditions~~
    - run lamp run
    - make plots
* make poster
  + background + motivation
    - parse thesis proposal
    - read (was it fujii? ohm) recent paper on that 2.5D simulations
    - write up marghitu parts
  + methods
    - write up fang part on Q, E0 -> ionization rate
    - write up knight / Kjell Rönnmark 2002 part on E0 -> accelerated current
    - write up Robinsonet al.[1987] (for electrons, Σe), and Galand and Richmond [2001] for (for protons, Σp) Q, E0 -> SIGP
    - Copy and adjust the gemini description from proposal
  + ~~fix aurora.m~~
    - ~~background E0 and Q are set in BG\_precip namelist~~
    - ~~start with j|| and E0~~
      * ~~agree on high\low E0 being two pops or one~~
      * ~~agree on edge gsls being constant width~~
      * ~~define J|| to have different widths~~
      * ~~ensure it still integrates to zero per cut~~
    - ~~get Q from E0 using maxwellian differential hemispherical number flux from fang 2008, eq (1):~~

# of e- with energies between E and E+dE / area / time

amount of charge from e- with energies between E and E+dE / area / time

* + - ~~allow for use of phi, not v, nor flow2pot~~
    - use Robinson 1987 / Galand and Richmond 2001: E0, Q -> SIGP, SIGH (for electrons and protons) see marghitu eqs (6-8) in keV and mW/m^2
  + do runs
    - ~~null:~~
      * Q: what happens to a super boring arc when given 3D?
      * A: Maxwells eqns are 3D, current finds path into 3rd dim. least resistance
    - mallin 2d v 3d
      * Q: how well does this picture hold up? are there eddies?
      * A: eddies likely a result of dimensional constraint
    - high Q low E0
      * Q: what's the altitude dependence of precip?
      * A: the higher the ionization dump, the more like mallinckrodt, less J\_H
      * Q: do U-shape potentials form to allow for more J\_H i.e. less joule heating? Is this energy difference balanced by j|| \* E||?
    - sharc
      * Q: what happens to the current closure path when it cant no more
      * A: ???
    - high precip arc
      * Q: what happens to the current closure path when we have local gradients?
      * A: ???
  + make plots
    - make concise input plots, or example thereof
    - fix fluxtube plots to look presentable and add j||, ne, sigma, cuts, efield even?
* write proposal
  + read mike’s examples
* write paper
* include gemini induction
* include gemini fang2010 fix
  + implement integral described in fang notebook
  + put mask on fang if <100 eV, just have ion\_rate=0

Chart

Description automatically generated

Chart

Description automatically generated

Chart

Description automatically generated