M3D-C1 ZOOM Meeting

7/06/2020

Agenda

1. Announcements
2. CS Issues
    1. LBL report
    2. Bug-fix on SCOREC machines -- Seegyoung
    3. New Procedures for Developers – Nate Ferraro
    4. New system benchmark status – Jin Chen
    5. NERSC Time
    6. Changes to GIT master since last meeting
3. Physics Studies
    1. ITER VDE with new structure -- scj
    2. Runaways with sources Chen Z.
    3. M3D-C1 coupling to KORC: Clauser
    4. Other

Announcements

- Laboratory closed unless authorized
  - Once authorized, need to get single access code at http://rtw-screen.pppl.gov
- Princeton U. will only house ½ of undergrads at a time
  - Freshmen and Juniors in Fall, Sophomores and Seniors in Spring
  - Grad students unaffect
- Cluster Review Meeting Wed July 8 11:00 AM -- Prentice
- IAEA Technical Meeting on Disruptions and their mitigation
  - Will be held remotely 20-23 July
  - pre-recorded by talks July 13: (4:3) or (16:9) invited 25 min, other 15 min
  - Has anyone tried to upload a talk?
- SciDAC PI meeting scheduled for July 28-30 July 2020 is *cancelled*
  - Replaced by a half-day remote panel session on July 29
- ITPA MHD Meeting at IO October 14-16 2020
  - Open to Remote Participation
- IAEA Fusion Energy Conference postponed to May 2021

LBL Report?

Bug-fix on SCOREC machines

- about 1 hour ago, Seegyoung sent an email saying that she fixed a bug that caused all the regression tests to fail on the SCOREC machines
  - This could be related to other failures we have seen on eddy with the last debug printout related to “reuse KSP preconditioner”
  - Jin to investigat

New Procedures for Developers

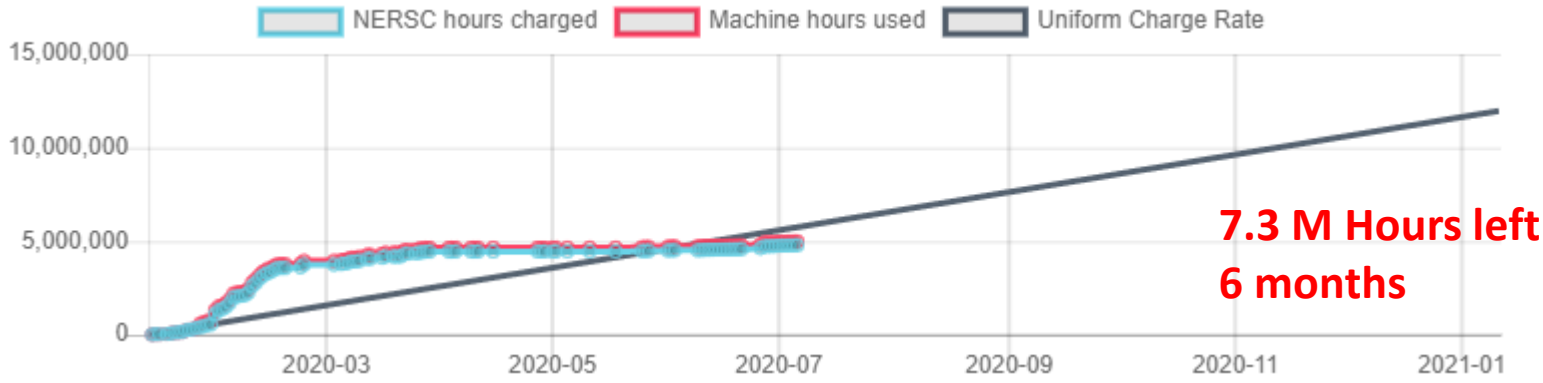
Nate Ferraro to report

Status of new computer acquisition.

Jin Chen to report

NERSC

MP288



M3163

Has not been updated.

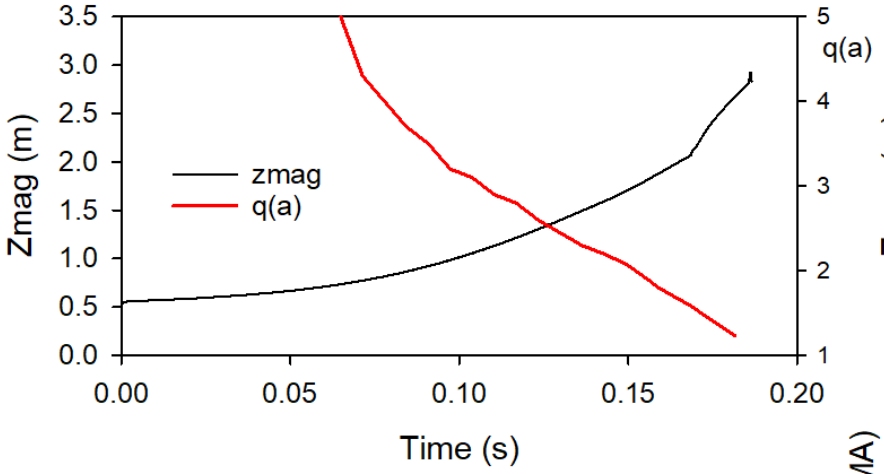
- Note NERSC down July 9-14
- We will get SOME new M3163 time, but not as much as last year
- Should be enough mp288 time to last until new PU computer arrives in the fall
- Do not waste time!

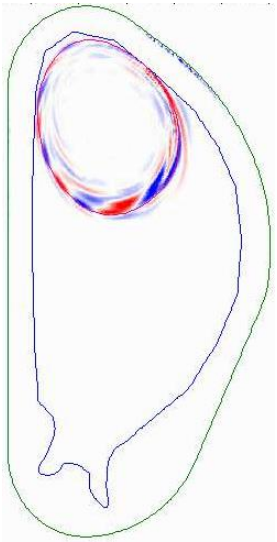
Changes to github master since last week

- Ferraro:
  - Added regtest batch scripts for greene, centos7
- Lyons
  - Read nplanes_in from time_NNN.h5 of restart file

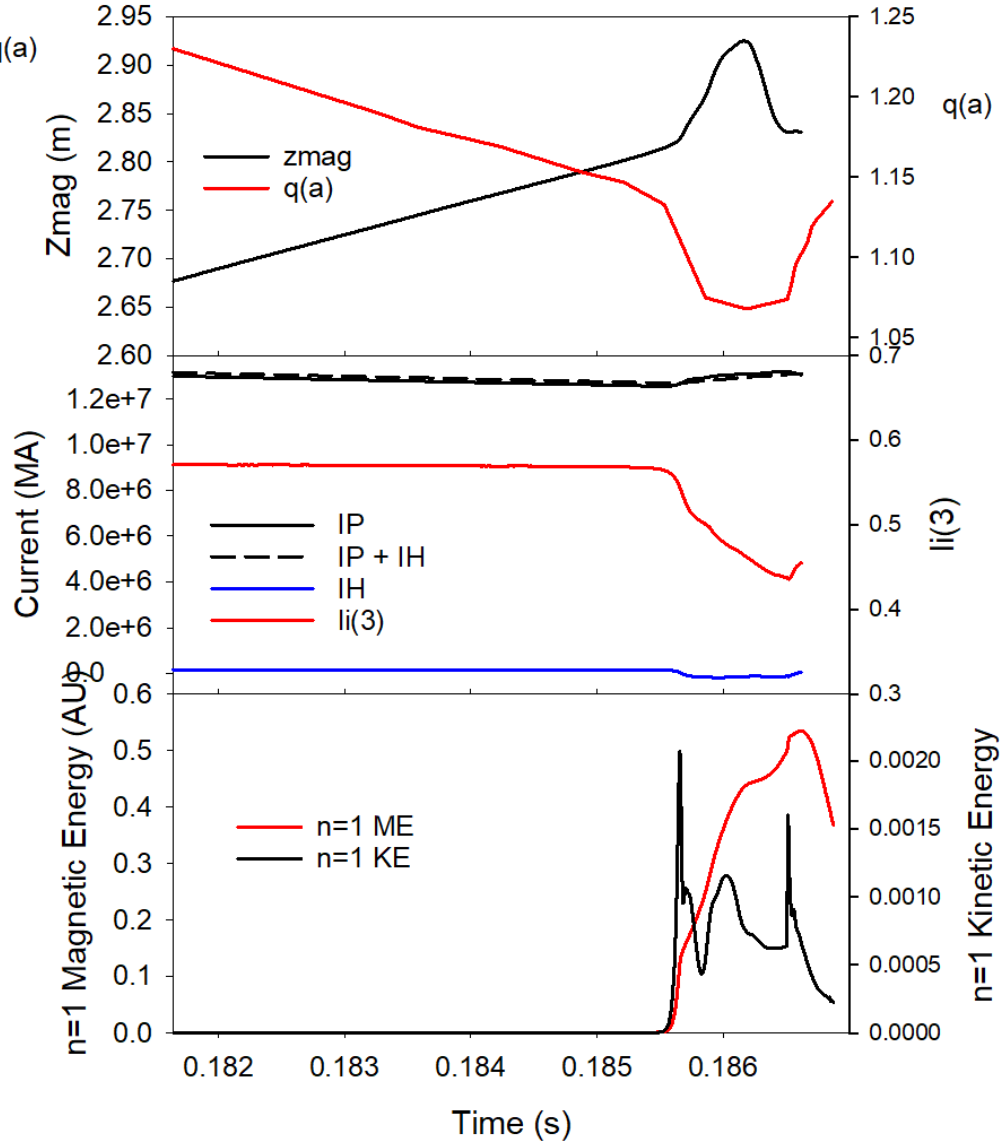
Documented changes in NEWDOC-latest: m3dc1.pppl.gov

ITER VDE with new structure

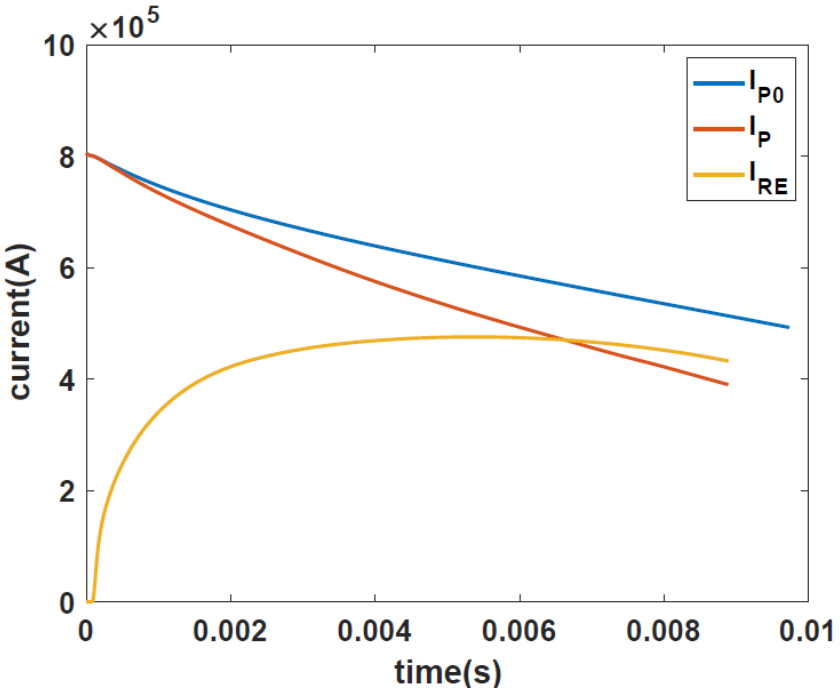




- Started 3D run when q(a) = 1.22
- q(a) does not go below 1 in 3D !
- n=1 MHD activity saturates at low value
- Will try starting 3D run with q(a) = .95



Runaways with Sources

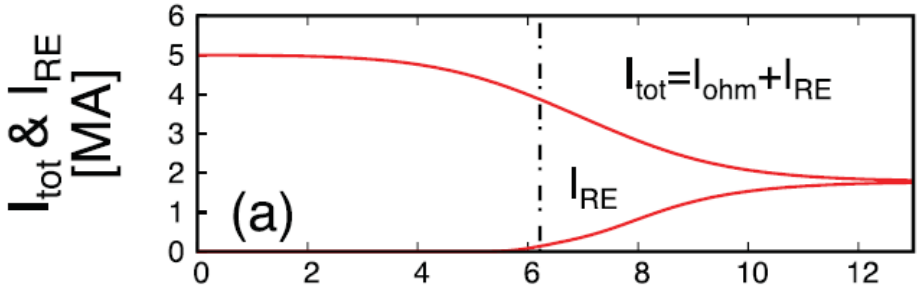


Chen: June 9, 2020

Nucl. Fusion **57** (2017) 066038 https://doi.org

Reduced fluid simulation of runaway electron generation in the presence of resistive kink modes

A. Matsuyama[a], N. Aiba and M. Yagi

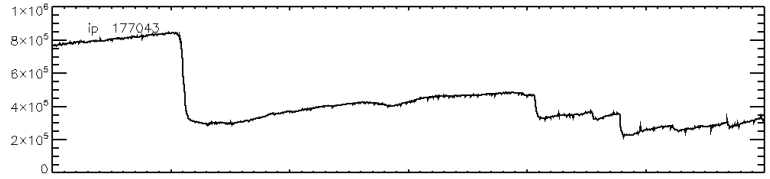


$$\frac{\partial n_{\mathrm{RE}}}{\partial t} + (v_{\mathrm{RE}}\mathbf{b} + \mathbf{u}) \cdot \nabla n_{\mathrm{RE}} = S_{\mathrm{Dreicer}} + S_{\mathrm{avalanche}},$$

$$E = \eta(J - en_{\mathrm{RE}}c),$$

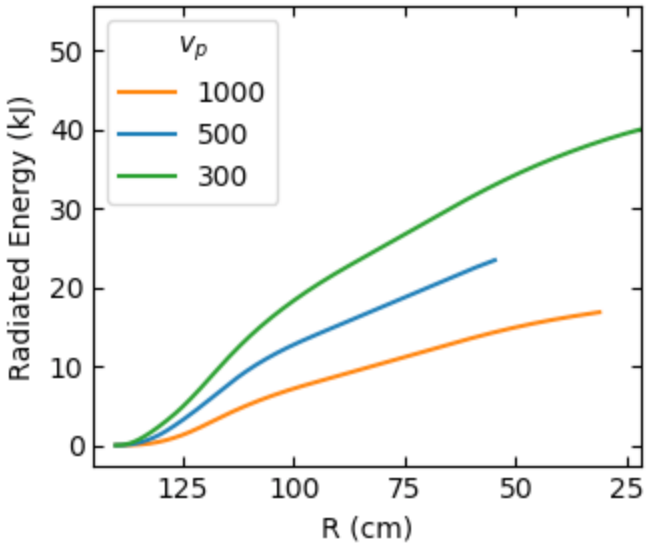
M3D-C1 coupling to RE code KORC

- Plan to target DIII-D shot 177053 after Chen has a full simulation with fluid runaway electrons



- KORC can now run using fields, densities, and temperatures from M3D-C1 hdf5 files using Nate's Fusion-IO routines

- Cesar trying to increase C-concentration to get stronger TQ and CQ



- Total radiated energy increases as pellet speed decreases
- Try 100 m/s ?
- Also trying uniform distribution in 2D

That’s All I have

Anything Else ?