**DIII–D ROF Proposal**

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| --- | --- | --- |
| **Subject:** | **<*Title of experimental proposal*>** | **Date: XXX XX, 2023**  **Revised: <date>** |

# Purpose of Experiment (*1/2 page of text*)

Physics or Technological Hypothesis to be tested or key advance aimed for: <*this might include an operational objective (whether a particular technique can achieve a specified result) and/or a research objective (e.g., resolving the mechanisms by which one behavior can influence another)>.*

Group Goal(s) being specifically addressed by this experiment, or else state new goal(s) that the group should adopt: <*best if group goal relates to a box in the ROF org chart*>.

Fusion Energy Impact: <*describe how this result will inform future research in this area and the impact of this work on the path to fusion energy>*.

(Optional) Principal Result Plots: <*provide description or cartoon*>

(Optional) Predict First: <*predictions from theory or simulation about the expected result of this experiment (if applicable). 1 or 2 sentence summary here, any figures in appendix*>.

(Optional) Additional scientific goals or piggy-back studies:

# Background <*1/2 to 1 page – key point is to help understand why this particular experiment is being pursued and/or the context*>

*<Motivate the studies – the challenge faced by future reactors, past progress that leads to the studies proposed here, particular roadblocks, promising techniques that may be adopted here>*

*<What is particularly important to get from DIII-D in this study, now? (what does DIII-D uniquely bring? What facet is timely and why?*>

# Experimental Approach <*1/2-1 page, explain what is measured and how, rationale for key choices in approach, decision points, and to provide an overview description of the techniques used*>

*Describe the approach to be applied, what techniques to use, parameters to be scanned.*

* *Give a reference shot if possible, explain how it will be adapted.*
* *Discuss rational for choice of techniques to be applied and parameter settings.*
* *(optional) Provide diagram of time traces of key parameters for discharge design.*

*Layout (at a high level – not the detailed shot plan order) the logic of the progression of stages in the experiment and the physics addressed by each. Note any decision points or branches in path.*

*Flag any pitfalls or aspects that may need additional time or contingency planning (e.g., if modes strike, or effect you are looking for does not manifest as expected).*

*Flag any elements requiring calculation or analysis prior to experiment.*

# Resources <*typically 1/2 page of text*>

# *<Data on tokamak, NBI, ECH, diagnostics, gas, IC-coil and cryopump systems. Include additional explanatory/descriptive comments, or data needed for review, e.g., special NBI or ECH duration and modulation requests, special IC-coil requirements, etc.*>

# Experimental Plan <*1/2-1 page of text*>

*<Describe each step conceptually with a phrase. Convey main scans to be done. For each step provide a realistic estimate of number of shots*>

1. **Step 1 description based on shot xxxxx (2 – 6 shots)** 
   1. Dial up reference. (2 shots)
   2. <describe a step or scan> (2-4 shots)
   3. Contingence step (if undesirable event happens) (0-2 shots)
2. **Step 2 description (4 – 14 shots)**
   1. <describe a step or scan> (4-6 shots)
   2. …

*(Decision point: Describe if next step might depend on what seen in above steps.)*

1. **Step 3: (0-8 shots).**
   1. <describe a step or scan> (4-6 shots)
   2. …

***At this point we have met our main goal – following points desirable for documentation, more complete measurement or useful extensions***

1. Step description (2 shots)
2. …

#### **Total 20-25 shots**

# Analysis Plan <*1/2-1 page with table*>

<*Specify the anticipated publishable plot(s) to be derived from the experiment>*

*<Give details of the elements of an analysis plan (topical breakdown, data analysis, code simulations, etc.) that will lead to generating the plot(s) and publication(s)>*

## Analysis Needs

|  |  |
| --- | --- |
| *Task* | *Skills and Codes Needed* |
| Task 1 | Skill 1, Code 1 |
| Task 2 | Skill 2, Code 2 |
| Task 3 | Skill 3, Code 3 |

# Appendix 1: ‘Predict First’ Predictions (if applicable)

<*Paste in any plots, slides, quotes from papers, or table from work that uses theory or simulation predict specific results expected in this experiment.*>

# Appendix 2: Workforce Development (if applicable)

<*Without personnel or institution names, discuss whether students or early career personnel will be developed, and whether personnel from protected groups or minority serving institutions will be engaged.*>