Work Diary for

Scram Jet

Project

1. 12/5/17

Started with the project, start the course on EDx.

Sir give us thought problems to work upon …

Ques:

* For below design condition Mach no. how shock wave will interact?
* Changes will occur in Brayton cycle, explain those changes?
* How capture area will be affected?

Ans:

* Changing Mach no. will deflect solution from its design condition, shock wave will intersect at point other than cowl tip which ultimately leads to non-uniform flow in the engine.
* We try some numerical analysis which told us that change in entropy will be higher than design case as graph will be shifted towards the right and down. As it will not reach its design condition peak temperature, it will be lower.
* Capture area will be decrease (If Mach no is increase from design condition) as last flow line which will comes from higher position which is deflected by large amount.

1. 15/5/17

We continue our work on EDx course (Hypersonic to scramjet). Completed the sections

1. 17/5/17

We continue our work on EDx course

1. 19/5/17

Sir asked to complete the project and complete the course by Monday.

1. 22/5/17

We completed the course project of EDx and discuss our result with sir, sir also asked to think upon the design parameter for Mach no. 7, asked us to get design value.

1. 24/5/17

Determine that due to varies design restraint it is very tough to optimize the solution. (Obviously). Corrected and remove the bugs in Pranav code hence making it redundant and compatible with EDx course project.

1. 26/5/17

Sick, taken the leave.

1. 29/5/17

Started working to include fanno flow in original code. Applied fanno flow such that for whole combustor length fanno flow is consider with constant friction coefficient and at the end Rayleigh flow is consider. Yes, it is not physically correct, for the moment but taking baby steps for now. Currently working on implementation of code. **Basically little stuck with the solving of non-linear equation roots on matlab.** Need to see other ways to do it.

Arjav and Tanisha is working on mixed fanno and Rayleigh flow which will be my next step for project.

23/6/2017

As I have shifted to Isolator need to figure out somethings

Things to do next in Isolator----

Best Idea-- Start learning basic of stuff, if get stuck contact other people in department who are expert in it.

1. Come up with the Idea how to validate your model with experimental data.

1.1. Decide validation parameter

1.1.1. Need to understand exact function of Isolator.

1.1.2. What happens differently with and without Isolator?

1.1.3.

2. Need to understand Isolator and its working and complete detail of it.

2.1 How shocks generate in Isolator and what causes them?

2.2 How boundary layer occurs in Isolator?

2.3 What causes separation in those boundary layer?

2.4 Why shock waves are generated in combustor?

2.5 How shock train formed and detail about it?

2.6 Understand more about boundary layer.

2.7 Identify condition on M,P,Pt in combustor inlet for proper functioning of scramjet combustor.

2.8 Check Normal Shock train and Oblique Shock train.

2.9 How normal shock formation led to flow separation?

2.10

3. Question Need to be asked.

3.1 How it is decided that from where shock train will start?

3.2 How fuel Injector affects the flow?

3.3 Others things affecting the flow like Flow convergence due to boundary layer, skin friction coefficient, perfect gas assumption.

3.4 How inlet Mach no. and thickness of boundary layer affects types of Shock train.