TSVV 2: Negative triangularity July meeting



Justin Ball 27 July 2021



Agenda

EUROfusion updates

- Experimental TCV equilibria
- Roundtable discussion with team members
- Team meetings, schedule, and resources
- Comments, questions?



EUROfusion updates

- 1. Advanced Computing Hubs (ACHs) have now officially started
 - Only a portion of our ACH requests were granted
 - Joint ORB5 request (with other TSVVs) got 3 PMs in 2021 and 6 PMs in 2022
 - Ensuring IMAS compatibility got 2 PMs in 2021 and 2 PMs in 2022 (let me know if you are keen to take advantage of this)
 - Limited impact on our work plan, so perhaps it's fair given the significant cuts to the ACHs



EUROfusion updates (contd.)

- 2. Very little travel funds will be available to the TSVVs
 - Only ~700 EUR per TSVV in 2021 or about 1 mission
 - This is recognized by everyone as a problem
 - Let me know if you'd like to travel
- 3. Work Package Tokamak Exploitation (WPTE) RT07 on Negative Triangularity scenarios as an alternative for DEMO
 - No experiments this year, but resources for modeling/data analysis
 - <u>https://wiki.euro-fusion.org/wiki/</u>
 <u>WPTE_wikipages:_Experimental_campaign_2021:RT07</u>



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• Sent out via email and available on the TSVV 2 wiki

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-	Diverted, PT	-	69515	1.58	1.43	+0.34	1.84	1020	3.29	239	7.1	in H-mode; no CXRS so Ti=Te
-	Diverted, NT	-	69340	1.60	1.40	-0.27			2.92	217	5.4	with Langmuir probes



New limited comparison at constant heating

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• Two NT equilibria with Langmuir probe SOL measurements

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One H-mode shot for comparison (but without CXRS)

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• The Ti profiles are still being refined and may be adjusted somewhat

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• To improve q_{95} comparisons, 69515 will be replaced by 70713

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Linear scoping study [IMPORTANT CAVEAT LATER]

- Linear analysis with kinetic electrons at $\rho_{tor} = 0.72$ indicate strongly driven turbulence





Linear scoping study [IMPORTANT CAVEAT LATER]

• Fortunately, a common rule rule of thumb, comparing γ/k_y suggests that electron gyroradius-scale turbulence is weak





Linear scoping study [IMPORTANT CAVEAT LATER]

• Roughly half of equilibria appear ITG dominated (i.e. $\omega > 0$), while the other half are TEM dominated (i.e. $\omega < 0$)





• Run some preliminary nonlinear simulations using comparison 3

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 Found that logarithmic profiles have significant oscillations, which complicates analysis considerably





Visible in profiles themselves





• Regardless, swapping plasma profiles indicates that NT is stabilizing





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Marconi reminder

- 41% through the allocation period (March 2021-Feb 2022)
- 10% of the following conventional A3 allocation has been used:
 - GENE: 375k node-hours = 100k (Alberto) + 125k (Justin) + 150k (MJ)
 - GBS: 175k node-hours
 - HYMAGYC: 100k node-hours
- 7% of the following GPU C1 allocation has been used:
 - ORB5: 80k node-hours



Team meetings

- Whole team meetings on the 4th Tuesday of each month at 15h
 - Next meeting on August 24th moved exceptionally to August 31st?
- I will contact each topical group (+RT07 participants) shortly to schedule a default, but flexible meeting time
 - Core turbulence: Justin, Peter, MJ, Alberto, Paola Mantica
 - SOL: Maurizio, (Paola Muscente), Paolo Innocente, (Paolo Ricci)
 - MHD: Giuliana, Antoine, Hinrich, (Gregorio)
 - Fast particles: Hinrich, Matteo, Giuliana, (Gregorio)



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All done.



Initial turbulence results for comparison 3

• Found that logarithm profiles have significant scatter





Initial turbulence results for comparison 3

