Dear editor,

We would like to express our sincere gratitude to the reviewers for their thoughtful comments. We have carefully considered each of them and have made every effort to address the suggestions and requests. We believe that the revised version of the manuscript has been significantly improved compared to the original.

In particular, the "*Introduction*" has been enhanced with a concise yet comprehensive description of the VarDA method, which was previously introduced only in the methods section, making it challenging to follow the flow of the narrative. To better illustrate the challenges involved, we introduced the issues related to calculating velocity and pressure gradients in complex geometries, such as large arteries, and the sensitivity to noise. This addition was necessary to ensure a smoother and more intuitive progression of the related work.

The "*Related works*" section was thoroughly revised and rewritten to improve its coherence without introducing new references. Notably, the order of the *D'Elia*'s papers was adjusted to reflect a chronological sequence, which has also led to a more logical and structured flow of the discussion.

Furthermore, the "*Aim of the work*" have been refined to more clearly express that we leverage VarDA to estimate an optimal inlet boundary condition for a CFD simulation, where the inlet boundary condition initially consists of a noisy and uncertain 4D flow MRI-based velocity profile. The consistency between the CFD-computed velocity field and sparse 4D flow MRI data in the bulk flow region is enforced.

The "*Methods*" section underwent substantial restructuring, including the removal of the subsection "*Governing equations of the problem*", whose content has been integrated into the "*Forward model definition*" subsection. This revision was necessary to streamline the text, which had already reached its length limit, in order to allow for the inclusion of images. As a result, the mathematical model was summarized briefly, with a reference to:
"Stokes GG (2009) On the Theories of the Internal Friction of Fluids in Motion, and of the Equilibrium and Motion of Elastic Solids, Cambridge University Press, p 75129. Cambridge Library Collection - Mathematics, doi:10.1017/CBO9780511702242.005."

In response to the reviewers' suggestions, we have enriched the "*Optimization problem definition*" subsection with additional details, including the definition of "*c*", tolerance values and the maximum number of iterations. The graphic scheme of the variational data assimilation process was relocated to the end of the "*Methods*" section to ensure that all the concepts introduced by the figure were clearly explained beforehand. Additionally, all abbreviations in the caption were redefined to maximize readability.

We have also ensured that all definitions and acronyms, once introduced, are specified at the beginning and not repeated throughout the text. The only exception is the abstract, which is treated as a standalone paragraph: all definitions and acronyms introduced in the abstract have been reiterated in the core text for clarity.

In the "*Benchmark Tests*" section, we have clarified the abbreviations used for the various tests (2DVar, 2DVar+t, 3DVar and AAA benchmark) in relation to the reference VarDA method. Specifically, for the last benchmark, we have provided a more detailed explanation of the time reference used.

Furthermore, we explicitly referenced the link to the open-source GitHub repository where the entire code is available. We fully appreciate the reviewer's point and carefully considered the possibility of including the code within the body of the manuscript, as well as additional details that could benefit other FEniCS users. However, doing so would have significantly exceeded the page limit. Therefore, we have made the full code available in a GitHub repository at the following URL: https://github.com/saraparatico/proceedingsCodes/tree/main, as mentioned at the end of the Methods section in the revised manuscript. The code is now extensively commented, with particular attention given to the lines where special care was required during its implementation.

For reasons of space, we were also unable to introduce the mathematical formulation of the coupled scheme. However, since the coupled scheme is the standard mathematical and numerical formulation for solving fluid dynamics problems, and given that the focus of the paper is on the incremental pressure correction scheme, we did not find it essential to elaborate on the alternative method, which would have required significant additional space. Nevertheless, we have included a bibliographic reference that implements the coupled scheme for FSI simulations: *"Figueroa CA, Vignon-Clementel IE, Jansen KE, Hughes TJ, Taylor CA (2006) A coupled momentum method for modeling blood flow in three-dimensional deformable arteries. Computer Methods in Applied Mechanics and Engineering 195(41):5685–5706, doi:https://doi.org/10.1016/j.cma.2005.11.011"*
The fluid-only formulation is the appropriate one to describe the coupled scheme in CFD simulations.

While the "*Results*" section has remained largely unchanged, it has been complemented by two significant images: the sensitivity analysis of the regularization parameters for the 2DVar+t case and the WSS analysis for the real AAA case.

Finally, the "*Conclusion*" section has been revised to more clearly present the outcomes in relation to the initial objectives.

DETAILED RESPONSES TO REVIEWERS

Reviewer 1

Major Issues

1. **The added value of this chapter to the FEniCS community is currently unclear. While it demonstrates sophisticated use of FEniCS, the chapter lacks the inclusion of code, innovative implementations, or teaching moments that could engage and benefit the broader community. The reviewer strongly encourages the authors to consider how their work might better highlight the unique features and capabilities of FEniCS, providing insights and practical examples that other users could leverage, in line with the educational and illustrative approach of the original FEniCS book.**

We see the reviewer's point and we carefully considered the idea of including code in the body of the manuscript as well as considerations on the details requiring more attention, which could be useful to other FEniCS users. However, to do so we would have largely exceeded the page limit. For this reason, we instead made the whole code available in a GitHub repository through the url https://github.com/saraparatico/proceedingsCodes/tree/main, as mentioned at the end of the Methods section in the revised version of the manuscript. Also, now the code is widely commented, with an emphasis on the lines where special attention was required during implementation.

2. **The reviewer was able to locate and read the code, although I did not try running it. It seemed sparsely commented, but rather intuitive, knowing the topic.**

As mentioned in the reply to comment 1, now the comments in the code are much more extensive. In some cases, alternative implementations are described as comments and an explanation of why those did not work is included. We think that these hints may be useful to other users.

3. **The reviewer suggests that the authors carefully revisit their choice of references, prioritizing those that are either the original sources or the most widely cited and recognized in the field. Furthermore, some references seem insufficient to substantiate the authors' strong statements. Specific examples include:**

Khalid, A. K., Z. S. Othman, and CT MNM Shafee. "A review of mathematical modelling of blood flow in human circulatory system." ***Journal of Physics: Conference Series*****. Vol. 1988. No. 1. IOP Publishing, 2021.**

The reference was replaced with a more widely recognized and authoritative source:

George Gabriel Stokes, Mathematical and Physical Papers vol.1: On the Theories of the Internal Friction of Fluids in Motion, and of the Equilibrium and Motion of Elastic Solids. 2009, Cambridge University Press. DOI: 10.1017/CBO9780511702242.005

Salman, Huseyin Enes, and Huseyin Cagatay Yalcin. "Computational modeling of blood flow hemodynamics for biomechanical investigation of cardiac development and disease." ***Journal of Cardiovascular Development and Disease*****8.2 (2021): 14.**

The reference was replaced with a more widely recognized and authoritative source:

Kheyfets VO, Rios L, Smith T, Schroeder T, Mueller J, Murali S, Lasorda D, Zikos A, Spotti J, Reilly JJ Jr, Finol EA. Patient-Specific Computational Modeling of Blood Flow in the Pulmonary Arterial Circulation. *Computer Methods and Programs in Biomedicine. 2015; 120(2): 88-101 DOI: 10.1016/j.cmpb.2015.04.005*

Pozzi, Silvia, et al. "A surrogate model for plaque modeling in carotids based on Robin conditions calibrated by cine MRI data." ***International Journal for Numerical Methods in Biomedical Engineering*** **37.5 (2021): e3447.**

As the reviewer pointed out, the reference to "Pozzi et al." was not fully consistent with the context of the paragraph, which already cites two other papers that are more directly related to the described work. Therefore, this reference was removed.

Lattanzi, Simona. "Abdominal aortic aneurysms: pathophysiology and clinical issues." ***Journal of Internal Medicine*** **288.3 (2020): 376-378.**

The reference was replaced with a more widely recognized and authoritative source:

Sakalihasan N, Limet R, Defawe OD. Abdominal aortic aneurysm. *The Lancet*. 2005; 365(9470):1577-1589. DOI: 10.1016/S0140-6736(05)66459-8

4. **The references in the chapter require cleanup and standardization to ensure consistency. Currently, the citation style varies throughout, which can detract from the overall professionalism and readability of the work.**

We thank the reviewer for pointing out this issue. We made the citation style consistent throughout the body of the manuscript and in the Reference section.

5. **VarDA is introduced early, but what it refers to is unclear.**

We thank the reviewer for pointing this out. Indeed, albeit defined in the abstract, the acronym VarDA was not defined the first time it was mentioned in the body of the manuscript, i.e., in the Introduction section. Now it is properly defined.

Also, in the original version of the manuscript, the technical details of the VarDA approach were thoroughly addressed in the subsection "Data Assimilation Method". However, we do recognize that readers with no previous knowledge of the method had to read several pages before accessing those details. Hence, in the current version of the paper the method is now briefly introduced already in the Introduction section, along with some considerations on the challenge of applying it to the specific case of blood fluid dynamics. We think that these considerations allow readers to better understand the subsequent Related Works section, namely with reference to the studies by D'Elia and colleagues. Still, the technical details of the VarDA approach are explained the Methods section.

6. **The section on "Related Works" is presented in a listed and unconnected manner, which makes the narrative unclear. It is not immediately apparent what key points the authors aim to convey or how these works relate to their own. The reviewer suggests restructuring this section to create a more cohesive and insightful discussion, clearly linking the related works to the context and objectives of the chapter.**

The section Related Works was revised to enhance its cohesion. We hope this revision addresses the reviewer's suggestion.

7. **There appears to be a disconnect between the Aims stated at the beginning of the chapter and the Conclusions presented at the end.**

We thank the reviewer for pointing out this inconsistency. Actually, we realized that the original version of the Aims section focused more on the aim of VarDA in general than on the aim of our specific work. Hence, we heavily edited the section. The Conclusions section was reworked too, to make it consistent with the aims of the work.

Medium Issues

8. **The authors state: "D'Elia and Veneziani (2013) compared a noise-sensitive splitting method with a control-based approach in 2D Stokes flow simulations." However, it is unclear why the splitting method was sensitive to noise, and the second part of the sentence ("with a control-based approach in 2D Stokes flow simulations") is ambiguous and requires clarification. Furthermore, in the subsequent sentence, the authors mention, "Later research applied VarDA to the Navier-Stokes (NS) equations, using discrete optimization to incorporate noisy velocity data [D'Elia et al. (2012)]." This statement appears to be chronologically inconsistent, as the cited work predates the previously mentioned study.**

As mentioned in response to comment 6, the Related Works section has been reworked. In this process, the referred sentences have been completely changed. We now avoid the phrasing "splitting-scheme", since it can be misleading; indeed, we intended to refer to pressure-velocity coupling or pressure correction and not to time splitting. Also, now the link between the findings by D'Elia et al., 2012 and by D'Elia et al., 2013 that we highlight is now clearer. The chronological inconsistency has been resolved.

9. The authors say “adapting the optimization framework for different flow characteristics and constraints.” Precisely what the authors mean is difficult to understand, and the sentence could have been made more precise.

This sentence too was rephrased for better clarity.

10. The authors state, “2D straight conduit (2Dvar) in turbulent and laminar conditions,” but this claim is problematic. Turbulence is inherently three-dimensional and time-dependent, so it is difficult to accept a “2D” description in the context of turbulent flow. Even if the authors ran a 2D channel flow at very high Reynolds numbers to trigger transition, the added value of this approach remains questionable. The reviewer strongly recommends revising this section. However, based on the rest of the text, the reviewer may infer that the authors ran a laminar simulation at high Reynolds numbers. If this is the case, it would be clearer to rephrase the text accordingly, without using the term “turbulence.”

The reviewer is completely right: the term “turbulent” was used to refer to flow conditions characterized by high Reynolds numbers, but these two concepts are not equivalent in general (and for sure not in a 2D domain). The improper use of the term “turbulent” is avoided in the new version of the manuscript.

11. The authors might want to consider condensing their chapter into a more appropriate length. It is not obvious that 12 pages is needed to describe the core of the work to the FeniCS community.

Given the need to add visuals (please see comment 12 and our reply to it) and the need to avoid exceeding the page limit, we decided to remove the detailed description of the Navier-Stokes equation. We embedded the definition of the key variables and notations in the Forward Problem subsection, and we refer readers to an eminent reference for the detailed description of the equations. In this way, the manuscript is now shorter albeit richer in visuals.

12. In relation to my previous point, there is a noticeable lack of additional visuals beyond the excellent Figure 1. In the reviewer’s opinion, a chapter of this nature would benefit from including several figures that effectively illustrate and communicate the work at a glance. Currently, this is not the case, and the chapter, as it stands, is somewhat difficult to digest. This is particularly true for the results section, which is purely descriptive and very technical, making it challenging to follow. More creativity in presenting the results would have greatly enhanced readability and understanding.

We thank the reviewer for this suggestion. The original Figure 1.2 is now Figure 1.3 and it contains a second panel depicting the field of wall shear stresses on the AAA wall, which relates to comment 13. Also, a new figure (current Figure 1.2) was added to depict the key results from our benchmarks.

13. The authors mention WSS a number of times due to the effects on vascular remodelling (which was the original motivation), but do not actually show WSS maps or explain how their results might increase our understanding/impact of the work.

The WSS map on the AAA wall is now depicted in the new panel of current Figure 1.3, with an emphasis on the bifurcation of the abdominal aorta into the iliac arteries, where the WSS field is more complex. The difference between the very noisy WSS obtained by the simple post-processing of from 4D flow MRI and the results yielded by VarDA is striking. However, we would like to remark that analysing the WSS field in detail to infer about its possible links with the considered clinical condition is beyond the scope of the work.

14. **The authors say: "CFD models offer noiseless, well-resolved velocity fields, but typically require uncertain assumptions on BCs, including inlet velocity BCs." While this statement might be true in some cases, CFD is typically not free from numerical artefacts like numerical dispersion/diffusion, and is certainly not well-resolved most of the time. Might also want to rephrase that "CFD [...] typically require uncertain assumptions on BCs". Moreover, the authors do not explicitly emphasise or quantify how their CFD models are noiseless and well-resolved.**

We revised this section to offer a clearer and more comprehensive explanation of the concept. I trust that this revision adequately addresses the reviewer's suggestion.

Minor Issues

15. **The authors say that their method "respect mass conservation". Maybe conserve or preserve instead of "respect"?**

We thank the reviewer for this suggestion. Now "preserve" is used instead of "respect".

16. **The reviewer suspects there is something grammatically incorrect with the sentence starting with "Additionally, Dokken et al. (2020) multimesh finite element (FE) method"**

We thank the reviewer for pointing this mistake out; it resulted from an error in typing. The sentence was corrected into "Finally, Dokken et al. (2020) proposed a multimesh finite element (FE) method".

17. **Navier-Stokes abbreviation is repeated.**

The typo was corrected.

18. **The authors say "(i.e., the Tape)", but it is unclear what this is. As such, the text is difficult to follow.**

The "Tape" designates the initial numerical simulation utilizing tentative inlet boundary conditions (BCs). This designation was introduced for the sake of brevity, and it is now explained at the beginning of the Methods section, in the Data Assimilation Method subsection.

19. **Maybe consider rephrasing "FE solver solves".**

We thank the reviewer for this suggestion. We replaced 'solver' with 'computes' to eliminate redundancy.

20. **No abbreviations in captions that are not defined. E.g., in Figure 1, this applies to FE, NS, BC.**

We thank the reviewer for this suggestion. Now acronyms are defined also in the captions.

21. **It is maybe strange to cite "Khalid et al. (2021)" for the Navier-Stokes equations.**

We sincerely thank the reviewer for pointing this out. Now a more appropriate reference is used:

George Gabriel Stokes, Mathematical and Physical Papers vol.1: On the Theories of the Internal Friction of Fluids in Motion, and of the Equilibrium and Motion of Elastic Solids. 2009, Cambridge University Press. DOI: 10.1017/CBO9780511702242.005

22. **The authors mention the node spacing, but what is the size of the final mesh in terms of the number of elements?**

The number of mesh elements varies depending on the complexity of the case. The simplest 2D rectangular domain consists of 4,967 cells, while the 3D cylindrical case includes 74,968 cells. The most complex case, the AAA geometry, comprises 126,916 cells. This variation reflects the increasing geometric complexity and the corresponding resolution requirements. For clarity, the mesh details for the 2D and 3D geometries have been explicitly stated in the text, whereas for the AAA case, they are provided in the corresponding bibliographic reference.

23. "The explicit Crank-Nicolson (CN) time-integration scheme". CN is semi-implicit.

We sincerely thank the reviewer for pointing this out. The reviewer is absolutely right; it was our mistake to describe it as explicit.

24. The statement "The IPCS proposed in [Dokken et al. (2020)] was implemented" is misleading. Dokken did not propose the IPCS scheme; rather, Dokken's work can be cited for the implementation, the IPCS scheme itself was first introduced as an enhancement by Goda, Katuhiko in his 1979 paper: *A multistep technique with implicit difference schemes for calculating two- or three-dimensional cavity flows*(Journal of Computational Physics, 30(1):76-95). It would be more accurate to credit the original source when discussing the scheme itself.

We fully understand the reviewer's point and replaced the reference with the original source, as suggested.

25. The section "Optimization Problem definition" might be too dense for a general FEniCS audience to follow the logic. Might consider rephrasing/explaining slightly.

We understand the reviewer's point; however, the paragraph is the result of a careful condensation, made to adhere to the page limit, while ensuring that no important information is omitted.

26. Figure 1 is very nice and informative. However, none of the symbols are defined.

We fully understand the reviewer's point, that's the reason why we decided to move the image to the end of "Methods", as all the equations have already been explained.

Handling editor

Manuscript

- **The term VarDA is used extensively, together with both 4DVarDa, 2DVar+t and 3DVar. I believe VarDA is a collective term for all of these, but I think it would be good to state this explicitly.**

We fully understand the reviewer's point; therefore, we have clarified in the text the relationship between VarDA and the other abbreviations, as suggested.

- **It was not clear to me what an AAA geometry is. This might be obvious for a person from the blood flow simulation field, but I believe it would be appropriate to say what type of geometry this is.**

We sincerely thank the reviewer for pointing this out. The reviewer is absolutely right; the abbreviation was not previously defined, and we have now included it.

- **Figure 1 is a very nice summary of the model, but it contains a lot of equations that are not explained. It is also very small and so increasing the size or resolution is needed. Finally it is missing an arrow "<" from the purple box to the red box (inlet BC)**

We fully understand the reviewer's point for what concerns the absence of equations explanation, that's the reason why we decided to move the image to the end of "Methods", as all the equations have already been explained there. We also believe that increasing the size may not be feasible without disrupting the layout. However, we have enhanced the resolution, and there appears to be an improvement. Regarding the missing arrow, it is not required between the purple and red boxes, as the red box serves merely as an intermediary. The arrow should point from the purple box to the green box, indicating that if the condition in the purple box is not satisfied, the process moves to the green box, where the new inlet condition (i.e., gd) from the previous step is applied.

- **In the section "Optimization Problem definition", J(u) refers to equation 1.12, but this should be (1.11). The velocity "u" is also bold in the equation (1.11) while it appears not bold in the text.**

We thank the reviewer for pointing this mistake out; it resulted from an error in typing. We have now made the necessary correction.

- **When it comes to the regularization term, it is not clear to me why the symbol "c" is used, since it does not appear on the right hand side of (1.12). You should also refer to this equation when defining the PDE constrained optimization problem in (1.12).**

We fully understand the reviewer's point. Therefore, we have clarified the definition of 'c' in the text to address this point; it refers to the controlled variables.

- **I was also confused by the regularization term (1.12), since you first write it as an L2-norm over the entire domain, but in the next equation you define it as a boundary integral.**

We sincerely thank the reviewer for pointing this out. The reviewer is absolutely right; we have now made the necessary correction to the integral.

- **When it comes to convergence of the optimization, you write that "Convergence was ensured though Wolfe conditions", but you should also state the tolerances and maximum number of iterations used. Since you also used the L-BFGS algorithm, you should also state the bounds used for the optimization.**

Tolerances and maximum iterations have been specified in the revised text. However, no explicit bounds were imposed on the velocity variables during optimization, as they were allowed to vary within their physically reasonable ranges without further constraints. On the other hand, the L-BFGS algorithm was employed using its default settings, therefore this was specified in the text for clarity.

- **The use of capitalization in the text is a bit confusing. For example you use capitalization for "Tape" and "Coupled". What is the reason for this?**

We fully understand the reviewer's point. The reviewer is correct regarding 'Coupled,' as it is a generic term and should not be capitalized. However, 'Tape' is a specific term we defined to refer to that particular type of simulation. As such, we consider it a proper noun or title, which is why it is capitalized.

- **Equation (1.13) where you specify the time dependent function and the corresponding timings, I would be interested in where this is coming from. Do you have a reference, or how did you determine the values of these timings and the shape of the function?**

We sincerely thank the reviewer for pointing this out. We have included a bibliographic reference in the text:
Katz, A. M. (1977). *Physiology of the heart*. Retrieved from https://api.semanticscholar.org/CorpusID:262326887.

- **When you write "Besides determining the optimal velocity profile for CFD simulations, spatial andtemporal regularization terms [eq. (1.13)]", it should be (eq. 1.12).**

We thank the reviewer for pointing this mistake out; it resulted from an error in typing. We have now made the necessary correction.

- **When you write "The 4D flowdata were processed with in-house Python code DOI 10.5281/zenodo.7236014", you should instead cite the code and add the Zenodo link to the .bib file.**

We fully understand the reviewer's point. The fact is that, at the time of the initial writing of the paper, we were provided with the reference 'code DOI 10.5281/zenodo.7236014.' However, we have been unable to retrieve the code on Zenodo. As a result, we have cited the pertinent paper, which we believe sufficiently addresses the matter.

- **For the noisy measurements in the Patient-specific AAA case you don't say how much noise is added. Please clarify.**

We fully understand the reviewer's point. To address this suggestion, considering also the lack of space to deeply describe these methodologies, there is a reference to Saitta's paper and the method employed to synthetically generate noise. However, we have clarified in the text that the type of noise applied is the 'medium' noise, as specified in the paper.

Saitta S, Carioni M, Mukherjee S, Sch¨ onlieb CB, Redaelli A (2024) Implicit neural representations for unsupervised super-resolution and denoising of 4d flow mri. Computer Methods and Programs in Biomedicine 246:108057, doi:10.1016/J.CMPB.2024.108057

- **Also for the Patient-specific case you write that data was acquired during the third frame of the cardiac cycle, but it is hard to know when this is during the cardiac cycle. Does this correspond to End Diastole, End Systole? Or when is the first frame acquired and what is the framerate of the acquisition?**

We fully understand the reviewer's point. It was previously stated that the data corresponds to early systole; however, we have now included an explanation specifying the acquisition time frame—approximately 63 ms from the start of the cardiac cycle, with a time step of 21 ms. An additional specific explanation has been added in the related lines of code.

- **The results section of "Preliminary tests", you say that "the Coupled scheme faced convergence issues", but I could not see any explanation of the "Coupled scheme" in the Methods section.**

The reviewer is correct. However, the implementation of the coupled scheme cannot be described within the prescribed page limit. Additionally, since the splitting method is novel and the primary focus of the paper, the standard Coupled scheme was omitted from the explanation. However, we have included a bibliographic reference that implements the coupled scheme for FSI simulations. The fluid-only formulation is the appropriate one to describe the coupled scheme in CFD simulations.

Figueroa CA, Vignon-Clementel IE, Jansen KE, Hughes TJ, Taylor CA (2006) A coupled momentum method for modeling blood flow in three-dimensional deformable arteries. Computer Methods in Applied Mechanics and Engineering 195(41):5685–5706, doi:https://doi.org/10.1016/j.cma.2005.11.011

- **In general for the results, I believe the manuscript should have more figures showing the resulting velocity profiles for all the different test cases.**

We thank the reviewer for this suggestion. The original Figure 1.2 is now Figure 1.3 and it contains a second panel depicting the field of wall shear stresses on the AAA wall. Also, a new figure (current Figure 1.2) was added to depict the key results from our benchmarks.

- **Regarding the choice of alpha (regularization parameter), I am surprised that lowest RMSE was not obtained with the lowest value of alpha, since your loss function is essentially J = RMSE + alpha * regularization. My guess here would be that lower values of alpha yields better RMSE, while higher values of alpha yields smoother solutions. Could you elaborate?**

We fully understand the reviewer's point. We have expanded the text to address the reviewer's request. Given that the assumption was reasonable, we have incorporated it into the manuscript.

- **There is no reference to Figure 1.2 in the text**

We sincerely thank the reviewer for pointing this out. The reviewer is absolutely right; we have now added the suggested content.

- **You write about the WSS and say that you compared these values between the reconstructed velocity field and the CDF solution but it is hard for the reader to understand without a figure.**

We thank the reviewer for this suggestion. Relating to the previous suggestion's answer, the original Figure 1.2 is now Figure 1.3 and it contains a second panel depicting the field of wall shear stresses on the AAA wall.

- **Also the term iliac bifurcation is not a term I am familiar with, so this should be explained or highlighted in a corresponding figure.**

We fully understand the reviewer's point, that's the reason why we have added an explanation in the text.

Code

- **I would recommend to put the code in a different repo than the manuscript**

The request has been fulfilled: [saraparatico/proceedingsCodes: Codes associated to the chapter submitted for FEniCS Conference 2024 Proceeding.]

- **The repository is missing a README file with instructions on how to install and run the software. For example, I have no idea which scripts to actually run.**

We have written a README file that includes installation and requirement instructions, along with a detailed description of the content and the workflow to follow in order to run the codes. We trust this will be sufficient.