Reviewer 1:

===========================================================================  
The following revisions should be made:  
1. Please complete the last sentence of Section 2 (CTF). Also, the typo in Equation (3) and several other places should be corrected.  
2. Equation numbers in the text (Sections 2.3 and 3.2) should be corrected to be consistent with Equations (14) through (18).  
3. Please elaborate and clarify 'linear Krylov solver from PETSC' in Section 2.3. I do not understand what this is and many readers may not understand. Also explain 'L2 normalized'.  
4. What transient are you talking about in Section 3.4? Is it the null transient to obtain steady state results shown in Figure 5? Please make it clear.  
5. Is there any advantage for using the implicit method over the semi-implicit method? What is the run time or CPU time difference between the two methods? Please give specific examples of run/CPU times for the same problem with two different (semi-implicit vs. implicit) methods. Are the results from the two methods essentially the same? Please elaborate.  
===========================================================================

Reviewer 2:  
===========================================================================  
This paper presented a study of residual formulation of solid-liquid coupling for single-phase convective heat transfer, with implementations in the COBRA-TF code. The studied topic would be of interest of the reactor thermal-hydraulics community. However, the scope of this work is very limited, while the novelty and the contributions to the literature are unclear. This work is still very preliminary and no solid conclusions have been drawn from this work. The authors are suggested to consider the following comments to improve the paper and for their future study.

1.      Numerous studies are available in the literature on advanced numerical methods for reactor thermal-hydraulics analysis. The authors are suggested to perform a detailed literature review, better understand the current state-of-the-art and may reshape the approach and the objectives of their research work.  
2.      The authors should clearly define the objectives of this research work, and the relationship between the new formulations presented in this work and the existing CTF code. Do the authors plan to re-write a new version of CTF based on the new approach but with extended modeling capability to two-phase subchannel representation?  
3.      The authors are suggested to clearly present the new findings of this work. The effects of the implicitness in fluid modeling using finite volume approach and staggered grid are well known in the community. The implicit coupling approach between fluid and solid is not used in traditional system and subchannel codes, although applied in several new code developments. The effects of using the implicit coupling should be further studies in this work. It is unclear from the paper what benefits have been achieved with the implicit coupling.  
4.      The presentation of this paper should be significantly improved.  
a.      Page 2, incomplete sentence at the end of second paragraph.  
b.      Suggest including a nomenclature section.  
c.      The coupling between the fluid nodes and solid nodes are confusing (Fig. 3). More explanations are required.  
d.      Eq. 11, 12, and 13 the use of T\_i+1 and T\_i for fuel and cladding surface temperature would cause confusions. Suggest to modify.  
e.      Multiple implicit methods are used in this work, on temporal discretization of the fluid equations the solid conduction equation, and on the modeling of convective heat transfer. The authors should be precise and clear in using the term "implicit" in discussing the results of the test problem.  
f.      Figure 7 and 8, visualized comparison is not very informative. Suggest to plot the differences between the two approaches.

===========================================================================

Reviewer 3:  
===========================================================================  
The paper provides a description of the process to generate a residual based solution algorithm in CTF.  The authors cite other similar work, but do not provide any comparison of the methods used in this work and that work.  
  
There appears to be a significant amount of work that has been done; however, the details have not been provided.  Specifically, the equations that are used to define all of the residuals should be provided.  
===========================================================================