Dear reviewers,

Thanks for reviewing our paper and providing valuable feedbacks. We have carefully read your comments and modified our manuscript correspondingly. Below is our response to your specific questions.

1. **Section 2 should be combined to Section 1**.

**Reply**: We have integrated Section 2 with Section 1.

1. **The challenges of this work are not clear.**

**Reply**: We have described more specifically the challenges exascale computing needs to address by highlighting the expected increase in the number of failures and the need to operate under stringent power constraint. We also added a figure that illustrates the combined failure and power constraints under which exascale systems are expected to operate. The updated text is provided below:

“The large increase in number of components significantly increases the propensity of exascale computing systems to faults, while driving power consumption to unforeseen heights. Unfortunately, in so far as performance is concerned, resilience to failures and adherence to power budget constraints are two conflicting objectives, as achieving high performance may push the system's components past their thermal limit and increase their likelihood of failure.”

“The inherent vulnerability of extreme-scale computing systems, in terms of the envisioned high-rate and diversity of their faults, together with the demanding power constraints under which these systems will be designed to operate, calls for a radical reconsideration of the fault tolerance problem.”

1. **How can the convergence of the algorithm be guaranteed?**

We appreciate the reviewer’s comment with respect to this issue. We thereby provide an argument to discuss how convergence is achieved in our algorithm.

It is worth noting, that contrary to existing schemes where computation is rolled back in the occurrence of failure, Lazy Shadowing guarantees forward progress. This progress is achieved by associating every main process with a shadow process to ensure that resuming computation after failure continues based on what has been achieved by the shadow. Consequently, forward progress guarantees that the underlying application runs to completion, thereby ensuring convergence of our algorithm. As depicted in Figure 6(a), the results show that even for a system with 1 million nodes the probability that our algorithm needs to restart is only 0.001~0.0001.

1. **Reference numbers should be added to the paper.**

We have corrected that. We have double checked to make the reference numbers correct.