Second-round review for

"A Finite-Horizon Approach to Active Level Set Estimation"

It is acknowledged that authors addressed all the comments. However, I feel some responses are inadequate and new problems arise from the revision.

1. (Uniform prior, Comment 1) From the theoretical perspective, the drawbacks of non-uniform priors are unclear. Do non-uniform priors lead to sub-optimal policies? What priors are appropriate for the problem? What kind of strong (unrealistic) assumptions on boundary should be added to address non-uniform priors? To what extent will the computation cost increase to tune appropriate parameters in prior? I feel author's responses are vague or indirect. Clearer answers to these questions will be more convincing for me.

   From the practical perspective, we never know the true prior distribution in applications, even though the uniform prior leads to an optimal estimate in theory. Therefore, sensitivity analysis, e.g. simulations with θ generated from non-uniform prior, is important to assess the practical performance of the method. However, I do not find such analysis in the revision.

2. (Parameter tuning, Comment 3) Related questions to author's reply to Comment 3 are: How do we tune the PFHS parameters in practice? How can we do the grid search or other tuning procedures to choose good parameters *offline* before we obtain the real data by sampling with sensors? Will the parameter tuning not affect the *limiting cost* (sampling time and distance) in practice? The current real data analysis reports the search cost and errors with the given set of parameters (number of transects 5, stopping error 0.03, e.t.c.). Showing the real data parameter tuning procedure would be helpful.

3. (Sampling cost, Comment 2) A similar question as Comment 2: will the number of transects reflected in the sampling cost equation (15)?

4. (New noisy procedures) The new PFHS procedure takes the noise level σ^2 as an input. However, σ^2 is an unknown parameter in real life. How can we estimate σ^2 in practice (or how we estimate the sensor precision)? What are the effects of σ^2 estimation to the consistency of PFHS?

References