We wholeheartedly thank the reviewers for the positive and encouraging feedback, as well as for the insightful comments to improve our submitted work. We first also thank all the reviewers for finding multiple minor typos, which we commit on correcting in the revised version of our work. We now continue by addressing one comment appearing in multiple reviews (Reviewers #1, #2) and then proceed with addressing the additional comments of each reviewer separately.

(Admissibility Assumption) We thank the reviewers for asking more information regarding the admissibility assumption for our distribution. The assumption is meant to quantify the following intuitive statistical fact: to recover the median of a distribution from i.i.d. samples, the distribution needs to assign positive mass at every sufficiently small neighborhood around the median (and furthermore the less mass it assigns the harder it is to recover). An instance of this fact appears in a standard result in the theory of statistics (using e.g. the delta method) saying that the empirical median of i.i.d. random variables is only asymptotically normal when the data have a positive density at the true median, call if $f(m) > 0$ (the asymptotic variance of the empirical median becomes $4f(m)^{-2}$.) Note that $f(m) > 0$ indeed implies a positive mass in every sufficiently small neighborhood around the median. We adopted the specific quantification of the admissibility assumption directly from the earlier work of [BA19], [BA20] on private median estimation, so that we are in line with previous work. Yet, as suggested by Reviewer #2, indeed all our results can be generalized in a straightforward manner to the case where the distribution does not necessarily admit a density around the median in $[m(D) - r, m(D) + r]$ but still satisfies $|F(t) - F(s)| \geq L|t - s|$ for all $t, s \in [m(D) - r, m(D) + r]$, where F is the CDF of the distribution. We consider this an interesting remark and commit on expanding on the above discussion at the revised version of our work.

Reviewer #1

(Adaptivity to unknown problem parameters) We thank the reviewer for asking whether one can design an optimal private estimator who is adaptive to the parameters, that is it remains optimal without knowledge of the values of L, R, r. While our methods are not tailored to work in this setting, we consider this question of high importance and a very interesting direction of future work.

(Prior methods for private median estimation) To the best of our knowledge, we are the first to apply Lipschitz extension techniques, such as the “Extension Lemma", and the “truncated Laplacian" ideas in the context of private median estimation.

(Propositions 3.7 and 3.8) We thank the reviewer for pointing out to us two important typos in the proofs of Propositions 3.7. and 3.8. We commit on correcting them in the revised version of this work.

Reviewer #2

(Smooth sensitivity prior work) We thank the reviewer for pointing us to the interesting use of smooth sensitivity in the prior work of private median estimation. We commit to adding a discussion in our literature review and the proposed citations.

Reviewer #3

(Novelty) While we agree with the reviewer that using Lipschitz extension techniques and Laplace noise are among the most frequently used techniques in differential privacy, the specific way used in this work have only been used recently in a similar manner for learning Erdos-Renyi models in [BCSZ18b]. Importantly, in our submitted work we build and expand on the methods of [BCSZ18b], since we not only we appropriately use the Lipschitz extension technique - "the Extension Lemma"- developed in [BCSZ18b], but we show how the extension can be made in polynomial time in our context.

(The Extension Lemma- "non-technical claim") The reviewer is absolutely correct that the question in [BCSZ18a] is posed in terms of conditions under which the extension can be made in polynomial time. We commit on appropriately adjusting the wording in our paper for the revised version of our papers. That being said, while the authors of [BCSZ18a] cite in their conclusion multiple papers performing Lipschitz extensions in polynomial-time in prior work, none of these papers use the (admittedly powerful) extension method which is used to prove the Extension Lemma in [BCSZ18a]. To the best of our knowledge we are the first who show that this extension method can be made in polynomial-time in our context.

Reviewer #4

(Citations) We agree to add the link of the citation in the alias so that by clicking on it, the reader can easily reach the bibliography at the end.

(Empirical Evaluation- parameter dependence) We agree with the reviewer that some discussion analyzing the dependence of the various parameters on the optimal rate would help the reader to build intuition. We commit on adding some informal discussion on that, coupled with appropriate empirical evaluations, in the revised version of our work.