

1 We thank the reviewers for their valuable feedback, comments, and suggestions. Below we respond to the questions
2 raised by the reviewers:

3 **Reviewer 1:**

4 1. Our theorems do indeed show convergence of mean-field iteration and belief propagation to global optima over
5 the *entire domain* $[-1, 1]^n$, not just a subset. The reason $[0, 1]^n$ comes up is because the global optimizer
6 over the entire domain always lies in this orthant (for BP, this is nontrivial but proved as part of Theorem 3.4,
7 for MF it follows straightforwardly by a sign-flipping argument, as $(|x_1|, \dots, |x_n|)$ always has better objective
8 value than (x_1, \dots, x_n) in a ferromagnetic model). We will emphasize that global optimum always means the
9 true global optimum in the entire domain in the revision.

10 **Reviewer 2:**

11 1. Critical points in $[0, 1]^n$: same response as to reviewer 1 — the global optima over the entire domain $[-1, 1]^n$
12 always lie in the orthant $[0, 1]^n$, we will make this more explicit in the revised version.

13 2. Dual Bethe free energy: we agree that this formula did not appear explicitly in Yedidia, Freeman and Weiss and
14 thank the reviewer for the suggested citation. It also appears explicitly in the book by Mezard and Montanari
15 so we will add that as an explicit citation as well.

16 3. Linear time algorithm, other writing comments: we will make the phrasing more explicit as suggested by the
17 reviewer.

18 **Reviewer 3:**

19 1. Line 575: here ν is anything such that $\nu^{(T)} \leq \nu \leq \nu^{(0)}$ where $\nu^{(t)}$ is defined by BP iteration from $\nu^{(0)}$. We
20 will change ν to a different letter to minimize confusion in the next revision.

21 2. Line 622: we apologize for the lack of clarity in this step; in this inequality it's implicit that $h = B$ and we
22 will change all of the occurrences of h to B in the revised version. Then the inequality is immediate from
23 the fact that $\nu^*(B)$ is the maximizer of the Bethe free energy, and ν^* is one of the feasible points for this
24 maximization. We will add this and show more steps on line 626 for the benefit of future readers.

25 3. Other notation comments: we will make suggested improvements.