We thank the both referees for reading our manuscript in details and providing with valuable feedback. We think that contrition significantly improved the manuscript. Below, we give a detailed list of changes, following the referees’ suggestions:

Ref A

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3) We added a section to the supplementary (now section IX in SI), where we evaluate <1/Delta\_{12}^2> for the case when the messenger atom is placed close to the border of the cloud. Furthermore we added a paragraph to the end of section I in SI, explaining the result.

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6) Comparing our results to the standard quantum limit, as a benchmark, has the advantage of being easily comparable to other results that also compare themselves to SQL. In case of the results reported in Ref [10], they report a 70-fold increase in accuracy of phase measurement, which ideally would translate to the same enhancement in clock stability. We found a 12-fold enhancement in our analysis. To make the comparison easier, we changed the sentence about Ref [10] in the introduction to “Significant noise reduction has recently been demonstrated with spin-squeezed states in a single ensemble of atoms in [10], which reported a 70-fold enhancement of phase measurement accuracy beyond the standard quantum limit.”

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9) Yes, local oscillators of the clocks have to be phase locked prior to entangling the atoms. We added a clarification to the introduction: “… network of atomic clocks can result in substantial boost of the overall precision if multiple clocks are phase locked and connected by quantum entanglement.”

minor suggestions:

1) We added labels “M ensembles” to figure 1.

2) To improve the explanation of step 4 we changed the following:

- We modified the following sentence  
“, which promotes any population in s to r\_2, which then blocks the path via r\_1.” to   
“This promotes any population in s to r\_2, which then blocks the path g ↔ r\_1 ↔ f.”

- We moved the lower indices inside the kets in Eq. 4, so that the description in following text is easier to follow.

- We changed   
“measurement of n\_{s\_k} → m in {0,1}” to  
“measurement of n\_{s\_k}, yielding m in {0,1}”

- We replaced the arrow in “n\_{s\_k} → 0” and “n\_{s\_k} → 1” with equal signs.

- We moved the “k” index inside the ket in the expression of the GHZ state, to match with the convention used in Eq. (4).

3) We added the sentence “The kets, |n\_f>, |n\_s> for n in {0,1} stand for collective spin waves being excited by n quanta.” to the end of the paragraph of Eq 1.

Furthermore, to make the distinction between single-atom and collective states, we changed the symbol for the ground state from “|0>” to “|0\_f 0\_s>”. This way, it is clear that if a letter appears alone inside the ket, say |f>, it refers to a single atom state, while if it appears as subscript to a number, say |0\_f>, then the ket stands for a collective state. We remind the reader of this convention right after Eq. 5.

4) We added the sentence “This particular sequence results in emitting a single photon (from e → g transition) provided that the level s is empty, i.e. |0\_s>|vacuum> → |0\_s>|1 photon>.” to illustrate the immediate effect of applying the pulse sequence once.

5) Corrected typo. The sentence now reads “In such a case, the messenger atom can be used…”.

6) Added “(See Supplementary for details.)” after the sentence in question.

7) Corrected typo. Now it reads “[\pi]\_{f,r1}”, in the Supplementary.

8) Corrected typo. Now it reads "|e> -->|g> transitions", in the Supplementary.

9) We changed the symbol for cavity finesse from “f” to “I”, in and after Eq 22, in the Supplementary.

Ref B

1) We changed to title to the more specific “Quantum network of atom clocks: a possible implementation with neutral atoms”.

2) We added “Overall fidelity turns out to depend on the lattice geometry; it is the highest for 3D optical lattice.” to the end of paragraph 2 on page 4.

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