

Review of: "Polariton Peaks from the Coupled System of the Spin Triplet Transition and the Cavity, Classically Considered in the Linear Approximation"

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Potential competing interests: No potential competing interests to declare.

Comments:

Fokina and Elizbarashvili have studied the magnetization components of the transition of spin-triplet states with a varying field when an empty cavity is forced to transition by solving linearized coupled differential equations. The authors also discuss the polaritonic peaks limited by free and forced Rabi oscillations in the system. They studied the effect of spin-photon coupling on the normal and mutual decay rates. The reported results would be of greater interest to researchers working in the field, and the presented manuscript can be acceptable after minor corrections.

1. The introduction part is too short and lacks references.
2. The authors should mention the full form of EPR in the abstract.
3. The conclusion part is not written. Precisely, the authors have written only one sentence. I think the authors need to write more conclusions in this section.
4. Please kindly explain the STS transition (Z-X) in the theory part.
5. In the second paragraph of page 2, "eq" is missing. The line follows as ".....The solution of (1) was sought.....". Please correct.
6. The parameters h_k and h_K (with bold K) are the same or different? Similarly, h_k and h_K (probe) are different or the same.
7. In the second paragraph of page 2, how are the authors defined M and H in terms of m and h (with exponential terms)? If we take $1/t_c$ greater than $1/T_2$, the linear relation is still valid. Both H and h are probe fields. Likewise, M and m both are magnetization.
8. Figures 1, 2, and 3 are obtained by solving equation 10 and other equations which are in the form of w but the plots are in the unit of u, why?
9. How did the authors obtain Figure 2? Authors need to define the relation for detuning for better clarification. In figure 2, is there a discontinuity near 12.25 MHz? Please clarify.
10. The relative detunings are complex in the solution of equation number 9. Authors also discuss the results with the real part and explain three cases. Authors need to explain the contribution of the imaginary part. Are imaginary parts important or not?
11. What c defines and how does it come from? In eq. 16, is it 1m written?

12. For studying equation 16, three cases are discussed with three conditions by taking $a_1 a_2$ greater than, lower than, or equal to q_0^2 . But why did the authors use a square dependence instead of $a_1 a_2 > q_0$ and likewise three conditions which show a more linear relation?
13. How are the absorption and dispersion calculated from c ?
14. There is no discussion on Figure 5.
15. The result section should be before the conclusion part.
16. The discussed work is good and worthy of publication, but it is not written well and polished.