

Comments on “Simulation of ...” by Zakery et al.

This work reports simulated results for understanding previous experimental results of surface-enhanced Raman scattering reported by the Elliott’s group. The content seems to be original, while the presentation should be improved before a final judgment.

1. The equations on p. 4 are nearly duplicates of those in Ref. 13, which may be represented in a more sophisticated way. In addition, the presentation gives big confusion of scalar and vector, and also scalar product and vector product. This should be corrected.
2. This kind of simulation studies should be written so that it can be reproduced by readers. For that reproduction, the employed program should be referenced (opened) so that we can obtain it, and also employed quantities (of Au...) should be written.
3. The authors write that the obtained enhancement factor is  $\sim 10^6$ , which is one order greater than that of Ag. But, why? Can you write down the physical and intuitive reason?
4. I cannot follow “xyz-polarization” and “x-polarization”, since the illustrations in Fig. 4 are poor. Please improve those and define unambiguously.
5. Can you physically explain the obtained polarization dependence?

**We would like to thank the anonymous referee for very useful comments.**

- 1- Since we have written our own code (using MATLAB) in this work, we thought some mathematical details would be necessary to clarify the simulating purposes, although they are already known. Equations are revised such that scalars and vector quantities and their dot and matrix products are not confusing.
- 2- We have attached a flowchart showing details our code. If needed we can send the entire code in order to reproduce our results. Employed quantities of Au are taken from ref [16].
- 3- An order of magnitude increase in the enhancement factor achieved in this work is really due to the specific structure chosen for the substrate. This means that if we used silver instead of gold, we would have roughly the same enhancement factor. We have also checked our code and our numerical results, seems to be correct.
- 4- We have tried to enhance the quality of Figures and also presented the wave vectors and the electric field vectors by their related unit vectors.

- 5- It is well known that the interaction of the incident electromagnetic radiation and its coupling to photonic materials and photo-structures depends very much on the polarization state of the incident radiation; for example the interaction of the incident wave and a volume grating depends on the incident polarization (see " Volume holography and volume gratings, L. Solymar and D. J. Cooke, Academic Press, 1981"). However exact quantitative dependence in our work would be the subject of a separate study.

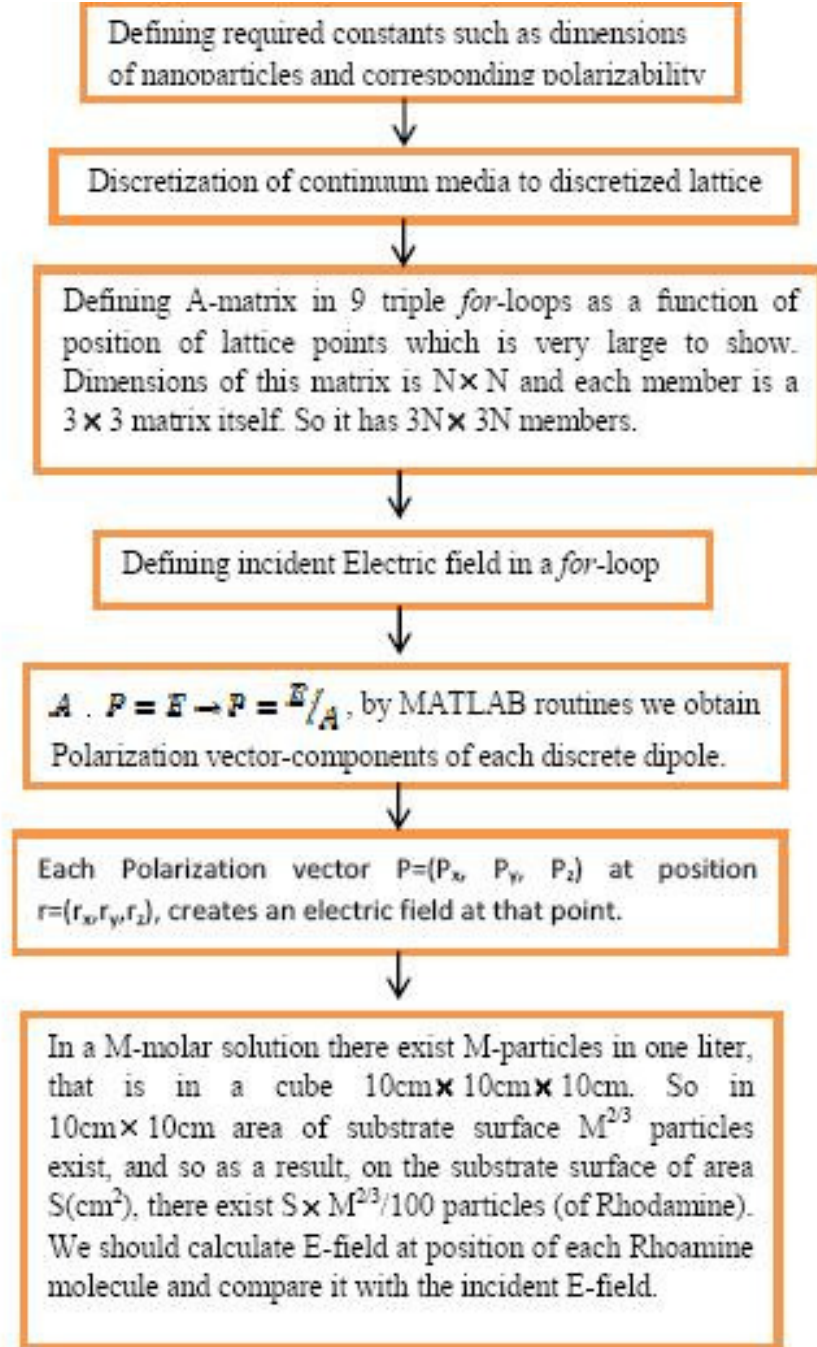


Fig. 1: The DDA simulation procedure.