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Journal Name:	<u>Physical Science International Journal</u>
Manuscript Number:	2014_PSIJ_9933
Title of the Manuscript:	Numerical Simulation of Spin Glass State in Diluted Magnetic Materials Using Ising Spin Model in 2D with Distance Dependent interactions
Type of the Article	Original Research Article

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PART 1: Review Comments

	Reviewer's comment	Author's comment <i>(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
<u>Compulsory</u> REVISION comments		
<u>Minor</u> REVISION comments		



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Optional/General comments

First of all it presents data that was already contained in a previous publication by the same authors, see Ref. [2].

The manuscript contains several wrong assertions. For example, in the introduction the sentence “This implies that there is no long-range order in spin glasses” makes no sense. At the end of page 3 the authors claim to introduce a diluted version for the model, but this is not true, as the diluted version has been already proposed in Ref.[11].

Data analysis is largely below the standards in the field of spin glasses. Showing only $P(q)$, as the authors do, is not enough to understand whether a spin glass phase exists at low temperatures. Indeed the 2D short range Edwards-Anderson model has no phase transition at finite temperatures, but still has very broad $P(q)$, that eventually will shrink to a delta function in the thermodynamical limit.

Finite size scaling analysis is completely absent from the manuscript and this not acceptable. Moreover the number of samples (100-200) is definitely too small in order to obtain any reliable result.

Convergence to equilibrium and thermalization tests are not shown at all.

I think that half of references are cited in places where they are meaningless.

I thank you very much for the comments but the data that we used for this paper is quite different from our previous paper in lattice size (L) and $\rho(\mu)$ value and temperature as well.

Ground state of spin glass at low temperature is a frozen disordered state instead of an ordered one (the magnetization is zero). This implies that there is no long-range order in spin glasses. This statement is quite correct because spin glass state is a consequence of frustration in spin at the spin sites. This means there is no ferromagnetic and antiferromagnetic order separately that is why we said “no long range order”.

Anyways, you can refer previous works in this regard.

As to me there is a misconception here. Yes, we used diluted version for the model because numerical simulations are very computer time demanding. That is if you consider all interaction, it will be beyond the computational capacity of computer. Therefore, this is also correct.

When we come to the data analysis, some times people used probability distribution of overlap parameter ($P(q)$) in order to show the phase transition and also some people used Binder parameter to identify the phase transition as the reviewer mentioned.



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Well, there is no finite size scaling in the manuscript because we used a physical quantity called overlap order parameter in order to determine the phase transition temperature. No need to use this here. As to the sample size, if you can use large size the result may be more accurate but that does not mean that there is no reliable result for sizes (100-200). Actually, we considered these sizes based on our computational facilities. The reviewer must understand this. If there is citation problem, we can correct it.