1 General Comments

This paper presents a novel way of estimating model error covariance inflation factor to be used in ensemble-based filters. It is known that the spread of ensembles in ensemble-based filters tend to collapse unless explicitly taken care of. A conventional way to arrest this collapse is to inflate the model error covariance using an inflation factor. There are a number of ways to estimate this inflation factor. This paper borrows its ideas of estimating the inflation factor from the realm of generalized cross validation techniques. The author demonstrates using a Lorenz model that this method is considerably better than a basic Ensemble Kalman Filter. However, when pitched against a constant multiplicative inflation factor scheme, this method fares slightly better but involves more computational cost.

The author should address the following questions:

1) How does the computational cost fare when compared to the constant multiplicative inflation factor method ? Keeping the number of processors fixed, how much more time (in percentage) does this new method take in each analysis cycle when the ensemble sizes vary from 10 to 30 to 50? The author is also advised to discuss this aspect in the context of operational meteorological/ocean models.
2) It is not clear what is the value of the constant multiplicative inflation factor. The author is advised to clearly mention it in the text and also in the figure captions.
3) The author is advised to include statistics of constant multiplicative inflation factor scheme in Table 1. This will help in understanding how the new method fares with respect to the constant multiplicative inflation factor scheme for larger ensemble sizes. This is relevant because most of the weather models use ensemble sizes much larger than 30 which is being used here.
The language in this paper needs revision. If the author can demonstrate that there is no significantly extra computational cost involved compared to the simple multiplicative inflation factor scheme, then this paper may be considered for publication.

2 Specific Comment

1) P3 L8 : What does the author mean by **fully considers** ?
2) P3 L13-17: The concept of global minima is introduced without any prior background thereby introducing discontinuity in the flow of the introduction.
3) P5 L15-16: What are the favorable properties of GCV and how are these properties relevant in the present context ?
4) P9 L12-15: "In previous studies, a number of methods ...". This has already been mentioned in the introduction and sounds repetitive.
5) P15 L14-15: What is the meaning of "greatly majority"? Also there are instances when $\lambda < 1$ in Fig(2). The significance of this should be discussed in the paper.
6) P15 L15-18: Is the value of constant multiplicative inflation factor set at $\lambda = 1.88$? If yes, what is the motivation of choosing the median ? The sentences used are not very clear.

3 Technical Comment

1) P6 L11-13: " Generally speaking, analysis sensitivity is used to apportion . . . ". It's not clear what the author wants to convey.
2) P7 L12: Change "**numeric**" to "numerical".
3) P9 L7-9: "The forecast error inflation scheme should be included ..." is grammatically incorrect.
4) P14 L17: "The frequency was set **as**..." is not grammatically correct.
5) P14 L20: " The variance of the observation **on** each grid ..." may be changed to " The variance of the observation **at** each grid ...".