Carlos Frederico Bastarz
National Institute for Space Research
Avenida dos Astronautas, 1778
Jardim da Granja
CEP 12227-010
São José dos Campos/SP Brazil

June 17, 2017

Dr. David Kristovich
Chief Editor of the Journal of Applied Meteorology and Climatology

We wish to submit a new manuscript entitled "**GSI-BASED HYBRID 3DVAR DATA ASSIMILATION FOR THE BAM-CPTEC/INPE: SINGLE LOW RESOLUTION EXPERIMENTS**" for consideration by the Journal of Applied Meteorology and Climatology.

This research is related to the application of a GSI-based hybrid 3DVar data assimilation coupled to the CPTEC/INPE general circulation model. The objetive of this research is to verify the impacts of the use of ensemble Kalman filter covariances combined with static covariances. This static covariance matrix was calculated using 730 pairs of 48/24 hours forecasts. The hybrid 3DVar system, is exercised with 40 members and a real non linear model. The results are encouraging and shows that when using the hybrid covariances with a greater contribution from the ensemble part, the forecasts skill are improved for various model state variables. We also show that hybrid covariances can also help the model to improve the distribution of the 24 hour precipitation, in both space and time. As we have evaluated the system performance for different regions of the globe, we found that the ensemble covariances helped the model to improve its skill in regions that are known to have a lower conventional observation coverage (eg. South Hemisphere/South America). We believe that this results whould be of the interest of the journal readers because it endorses the use of hybrid covariances in data assimilation applications, specially over the southern hemisphere.

We confirm that this work is original and has not been published elsewhere nor is it currently under consideration for publication elsewhere. All authors have approved the manuscript and agree with its submission to the Journal of Applied Meteorology and Climatology.

Please address all correspondence concerning this manuscript to me at carlos.frederico@cptec.inpe.br.

Thank you for your consideration of this manuscript.

Sincerely,

Carlos Frederico Bastarz on behalf of the authors