

# MULTI MODEL MIXTURE DENSITY ESTIMATORS & INFORMATION THEORY FOR STOCHASTIC FILTERING AND PREDICTION

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Multi Model Ensemble (MME) predictions are a popular ad-hoc technique for improving imperfect predictions of high-dimensional, multi-scale dynamical systems. The heuristic idea behind MME framework is simple: given a collection of imperfect models, one considers predictions obtained through the convex superposition of the individual probabilistic forecasts in the hope of mitigating model error. However, it is not obvious if this is a viable strategy and which models - and with what weights - should be included in the MME forecast in order to achieve the best predictive performance. I will show that an information-theoretic approach to this problem allows for deriving a sufficient condition for improving dynamical predictions within the MME framework; moreover, this formulation gives rise to systematic and practical guidelines for optimising data assimilation techniques which are based on multi model ensembles.

## REFERENCES

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