Understanding independence

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In order to perform any Bayesian processing of a model ensemble, we need a prior over the ensemble members. In the case of multimodel ensembles such as CMIP, the historical approach of "model democracy" (i.e. equal weight for all models in the sample) is no longer credible (if it ever was) due to model duplication and inbreeding. The question of "model independence" is central to the question of prior weights. However, although this question has been repeatedly raised, it has not yet been satisfactorily addressed.

Here I will discuss the issue of independence and present a theoretical foundation for understanding and analysing the ensemble in this context. I will also present some simple examples showing how these ideas may be applied and developed.