Fusion of Alternative Climate Models by Synchronization: Results With Realistic Models

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1. Introduction
• Climate models differ widely in their detailed projections.
• Can we do better than averaging model outputs?

2. A Supermodel Formed From Lorenz ’63 Models
Models Synchronize With Each Other and With “Truth”

3. A Supermodel Formed From SPEEDO Models
SPEEDO – a primitive equation atmosphere model (SPEEDY) coupled to land and ocean models

4. A Supermodel Formed From Two ECHAM Models With Different Convection Schemes (Nordeng and Tiedtke)
• COSMOS model (MPI, Germany)
• AGCM: ECHAM5, T31L19 (~3.75 degrees horizontally)
• OGCM: MPIOM, GR30L40 (~3 degrees)

5. Future Work
• Optimize connections in SPEEDO supermodel via machine learning.
• Introduce direct atmospheric connections in ECHAM supermodel, for increased synchronization, especially needed in midlatitudes.
• Apply to a regional climate phenomenon where there are large differences among models, e.g. AMOC.

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