

Breakout Group I

Identification of specific weather phenomena which couple strongly to climate and for which a subgrid model is necessary

What is climate?

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- ▶ Global vs. regional
- ▶ Time scales
- ▶ Spatial scales
- ▶ Statistics
- ▶ Application-specific requirements

Quantification of importance

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- ▶ Nesting
- ▶ Feedback analysis
- ▶ Simple comparisons/parameter sensitivity studies
- ▶ Downscaling
- ▶ Nearly resolved vs. impossible to resolve
- ▶ Hierarchy of (older/simplified) models: numerical continuation and bifurcation analysis

Processes

Mean	Var.	Tails	Process
G	G	G	Boundary layer state (for tropical convection; upscale processes)
G	G	G	Convection (moisture transport; momentum transport; mesoscale convective systems; convectively coupled waves; MJO)
G	G	R	Baroclinic eddies
?	-	G	Hurricanes/cyclones (ocean mixing; evaporation; transport of water to stratosphere)
R	G	R	Diurnal cycle (propagation of convection; boundary layer)
G	-	G	Surface fluxes (ocean-air)
G	G	G	Cloud microphysics
G	-	G	Gravity waves

G ⇒ important globally

R ⇒ important in some regions

? ⇒ unknown

- ⇒ not important, as far as we can tell