

ScenarioMIP: AGCI meeting wrapup and open questions

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Scenario MIP AGCI group:

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Category 1: Scenarios for Integration

Support integration of climate science, IAM and IAV research

Address overarching CMIP6 scientific questions

Allow for broad use addressing a wide range of specific scientific questions

Used by multiple research communities (climate modeling, IAM, IAV, policy)

Category 2: Targeted Scenarios

Address one or a small number of specific scientific questions

Used by a narrower range of research communities (primarily climate modeling)

Current ScenarioMIP Perspective

Scenarios for integration a top priority

Some combination with targeted scenarios may be possible

However: relevant targeted questions might be better addressed by or together with other MIPs

ScenarioMIP should focus on plausible future scenarios rather than idealized experiments

Types of Scenarios for Integration

Cover the range: SSP-based RCPs

Fill in the gaps: SSP baselines

Additional mitigation RCPs

Types of Targeted Scenarios

Land use and SLCF variants

Overshoot

Strawman Proposal

DECK: Original (SRES-based) RCP8.5

Tier 1

High forcing SSP baseline

Low forcing SSP-based RCP **or**

Mitigation gap scenario

Fill in the gaps

Tier 2

Medium forcing SSP-based RCP

Low forcing SSP-based RCP **or**

Mitigation gap scenario

Cover the range

Tier 3

Med-high forcing SSP-based RCP

High forcing SSP-based RCP

Strawman Proposal

DECK: Original (SRES-based) RCP8.5

Tier 1

High forcing SSP baseline

Low forcing SSP-based RCP **or**
Mitigation gap scenario

SSP x ($x = 2, \mathbf{3}, 4$)

SSP x -2.6 ($x = \mathbf{1}, 2, 5$)
or SSP x -3.7 ($x = 4, \dots$)

Tier 2

Medium forcing SSP-based RCP

Low forcing SSP-based RCP **or**
Mitigation gap scenario

SSP x -4.5 ($x = 2, 3, \mathbf{5}$)

Same as above

Tier 3

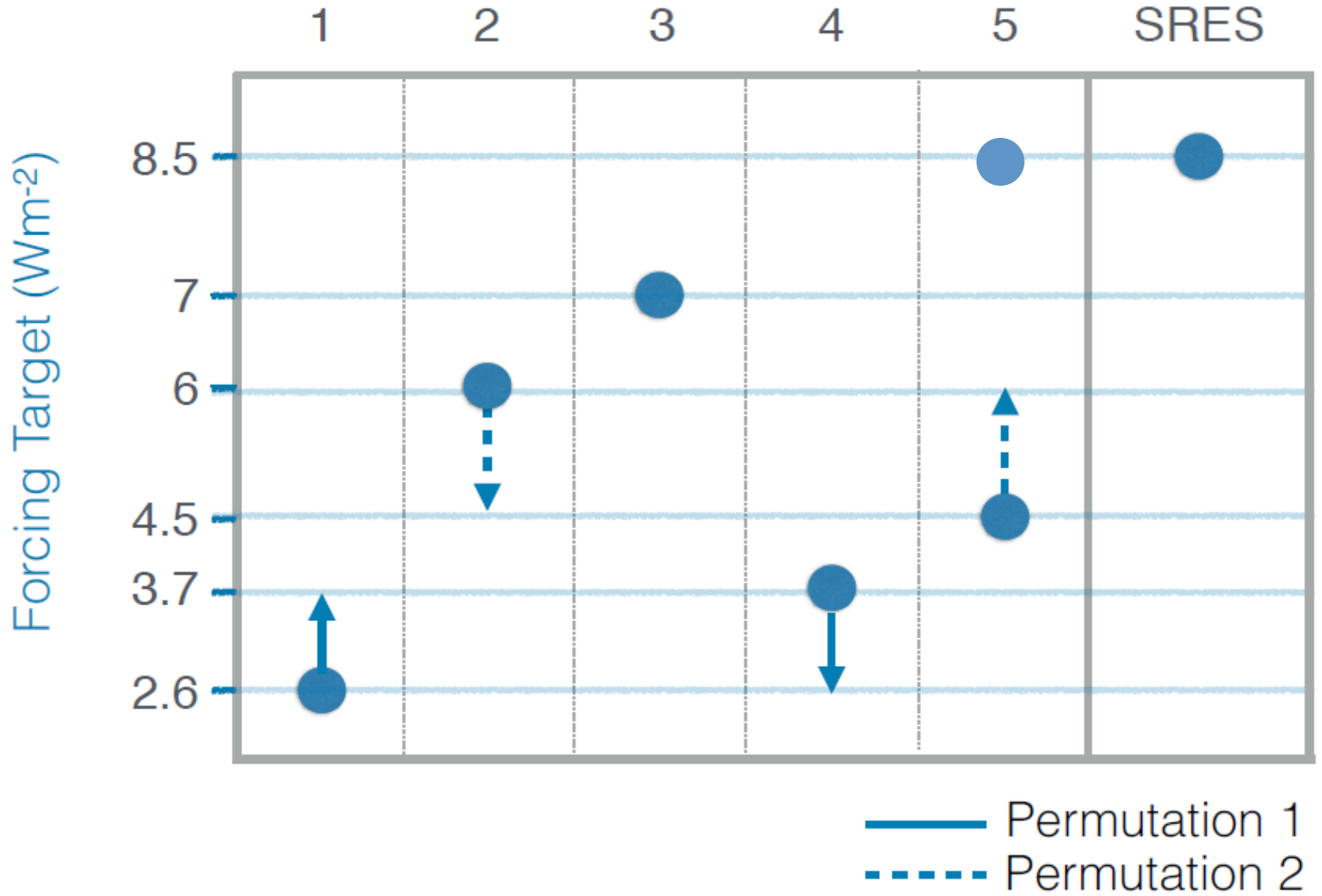
Medium-high forcing SSP-based
RCP

High forcing SSP-based RCP

SSP x -6.0 ($x = \mathbf{2}, 5$)

SSP5

SSP



Strawman Proposal

AerChemMIP anchor(s)

High forcing SSP baseline

SSPx (x = 2, **3**, 4)

Low forcing SSP-based RCP

SSPx-2.6 (x = 1?)

LUMIP anchor(s)

High forcing SSP baseline

Same as

Low forcing SSP-based RCP

AerChem?

C4MIP/Geoeng. anchor?

Overshoot

SSPx-2.6,3.7,4.5?,

(additional scenario)

overshoot variant

Strawman Proposal: Subject to Change

Types of scenarios making up the proposal
(relatively fixed?)

Grouping into tiers

Specific SSP/RCP choice for each type of
scenario

Open Questions (partially addressed)

IAM community:

What are the pros/cons of specific SSP/RCP combinations?

What are the ranges of land use, air pollutants across rows/columns?

IAV community:

For how long can CMIP5 simulations be relied on to meet needs?

How important is climate information for SSP baselines?

Climate modeling community:

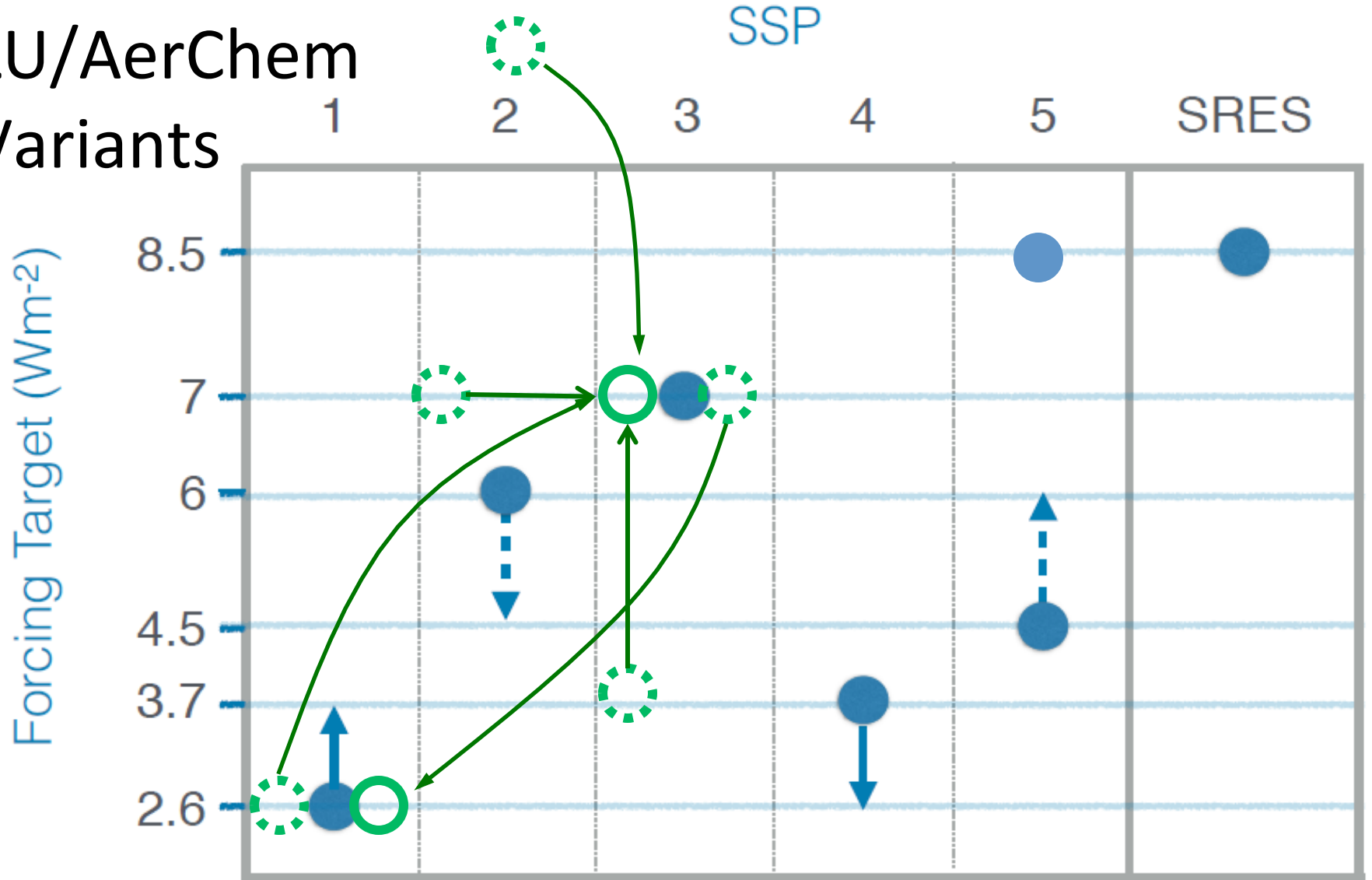
Do climate modelers anticipate substantial changes in projections relative to CMIP5?

What will be the interests of IPCC AR6 WG1 in new scenarios?

Land use/atmospheric chemistry community:

What is the importance of land use/SLCF effects to scenario consistency?

LU/AerChem Variants



○ LU/SLCF scenario variant
○ LU/SLCF component

— Permutation 1
- - - Permutation 2

LU/AerChem scenario variants

What is effect of alternative policies?

- Select alternative component within same column

- Select from newly created policy scenario

What is sensitivity of RCP climate outcome to alternative LU/SLCF components?

- Select alternative component within same row

What is sensitivity of climate to alternative LU/SLCF outcomes?

- Create stylized alternative component (CF, MFR)

- Select max/min components from anywhere in matrix

SSP3 baseline vs SSP1-2.6

Rationale

Doing a two-direction experiment requires two scenarios

To take advantage of ScenarioMIP simulations requires selecting from ScenarioMIP set

There are no row or column pairs in current design

Downside

Potential confusion about meaning/implications of experiment

Suggestions

Make function of variants clear in name (“sensitivity”)

Make sensitivity rationale and warning against interpretation clear in motivation

