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LASG/IAP Feedback to CMIP6

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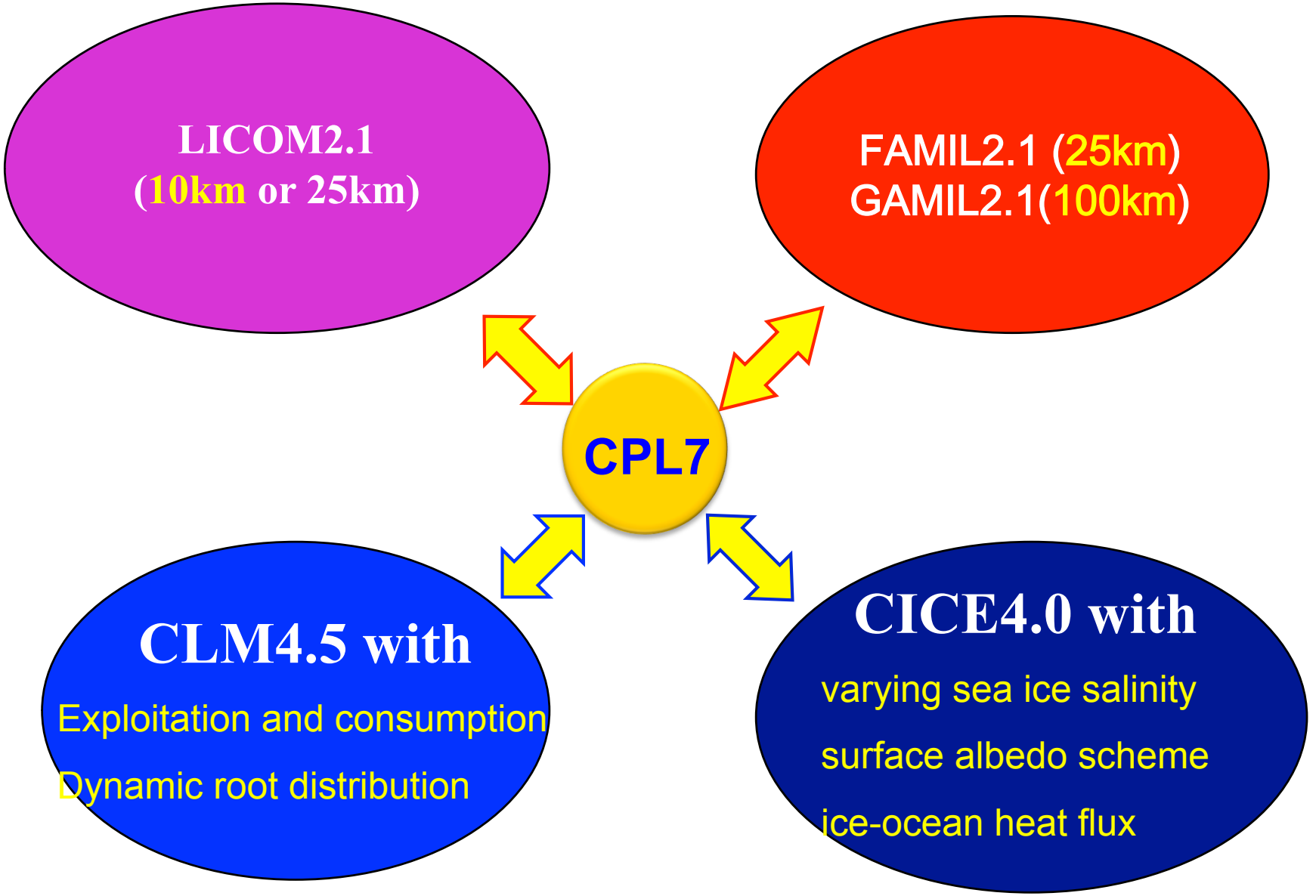
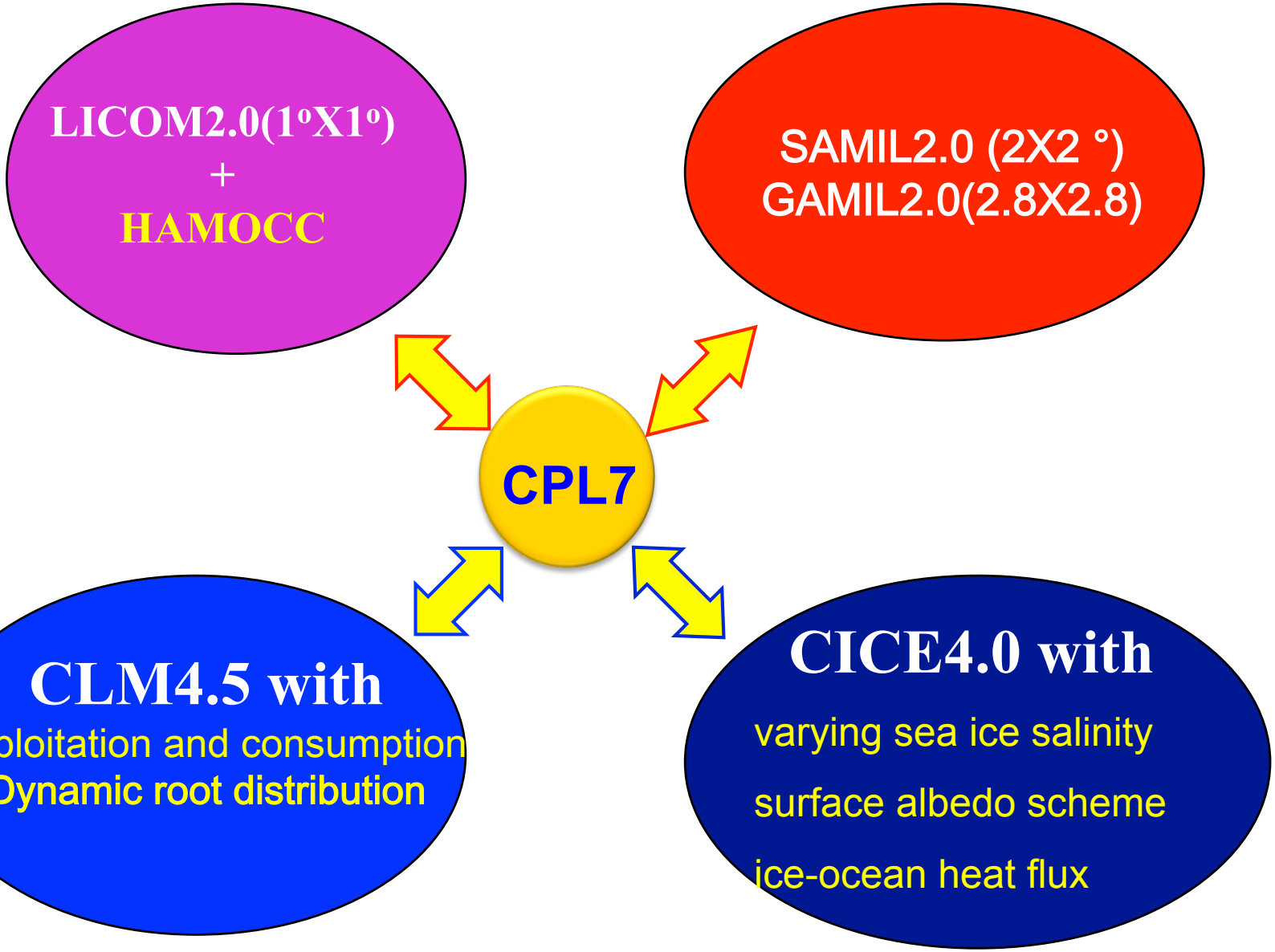
Outline

- Model configuration
- CMIP6 Design
- MIPs
- GMMIP

Climate System Model (CSM) in LASG/IAP



Erath System Model (ESM) in LASG/IAP



Main Improvements Relative to CMIP5

1. Increased resolution and improved dynamical core for AGCM (up to 25km) and OGCM (up to 10km)
2. Improved physical schemes such as tidal mixing in OGCM, boundary layer scheme, cumulus convection, radiation, in AGCM etc.
3. More complex chemical module in AGCM and biogeochemical cycles modules in land and ocean models.
4. More human activity processes such as land use, anthropogenic groundwater exploitation schemes in the land component.

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2. CMIP6 DESIGN

We prefer

(a) no further prioritization beyond the DECK so that modelling groups choose from the MIP experiments (that are prioritized in Tiers for some MIPs) entirely based on their scientific interest as proposed in Meehl et al., EOS, 2014

DECK:

1. AMIP simulation (1979-2010) == > 2014
2. Pre-industrial control simulation
3. 1%/yr CO2 increase
4. Switch-on 4XCO2 RUN

NUCLEUS:

1. 20thC simulation (1850-2005) == > near present (2014 ?)
2. Extended AMIP simulation (1950-2014) (match the reanalysis)
3. Overlapped Tier-1 experiments listed in more than 3 MIPs

FGOALS contribution to MIPs (*under discussion*)

	Short name of MIP	Long name of MIP	FGOALS China
1	**AerChemMIP**	Aerosols and Chemistry Model Intercomparison Project	**0**
2	**C4MIP**	Coupled Climate Carbon Cycle Model Intercomparison Project	**0**
3	**CFMIP**	Cloud Feedback Model Intercomparison Project	**1**
4	**DAMIP**	Detection and Attribution Model Intercomparison Project	**1**
5	**DCPP**	Decadal Climate Prediction Project	**1**
6	**FAFMIP**	Flux-Anomaly-Forced Model Intercomparison Project	**0**
7	**GDDEX**	Global Dynamical Downscaling Experiment	**2**
8	**GeoMIP**	Geoengineering Model Intercomparison Project	**0**
9	**GMMIP**	Global Monsoons Model Intercomparison Project	**1**
10	**HighResMIP**	High Resolution Model Intercomparison Project	**1**
11	**ISMIP6**	Ice Sheet Model Intercomparison Project for CMIP6	**0**
12	JCOMM*	Coordinated Ocean Wave Climate Project	**0**
13	**LS3MIP**	Land Surface, Snow and Soil Moisture	**1**
14	**LUMIP**	Land-Use Model Intercomparison Project	**1**
15	**nonlinMIP**	Non-linear Model Intercomparison Project	**2**
16	**OCMIP6**	Ocean Carbon Cycle Model Intercomparison Project, Phase 6	**2**
17	**PDRIP**	Precipitation Driver and Response Model Intercomparison Project	**2**
18	**PMIP**	Palaeoclimate Modelling Intercomparison Project	**1**
19	**RFMIP**	Radiative Forcing Model Intercomparison Project	**2**
20	ScenarioMIP**	Scenario Model Intercomparison Project	**2**
21	**SensMIP**	Sensitivity Model Intercomparison Project	**2**
22	**VolMIP**	Volcanic Forcings Model Intercomparison Project	**2**

0: if you do not plan to contribute simulations with your model to this MIP
1: if you plan to contribute simulations to this MIP
2: if you are not sure yet whether or not you will contribute simulations to this MIP

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GMMIP: Global Monsoons Model Inter-comparison Project

- **Sponsors:** **CLIVAR-GEWEX Monsoon Panel & CLIVAR C20C**
- **Motivation:** **To improve our understanding on how to reliably simulate the mean state, interannual variability and long-term change of global monsoons.**
- **Tear-1 :**

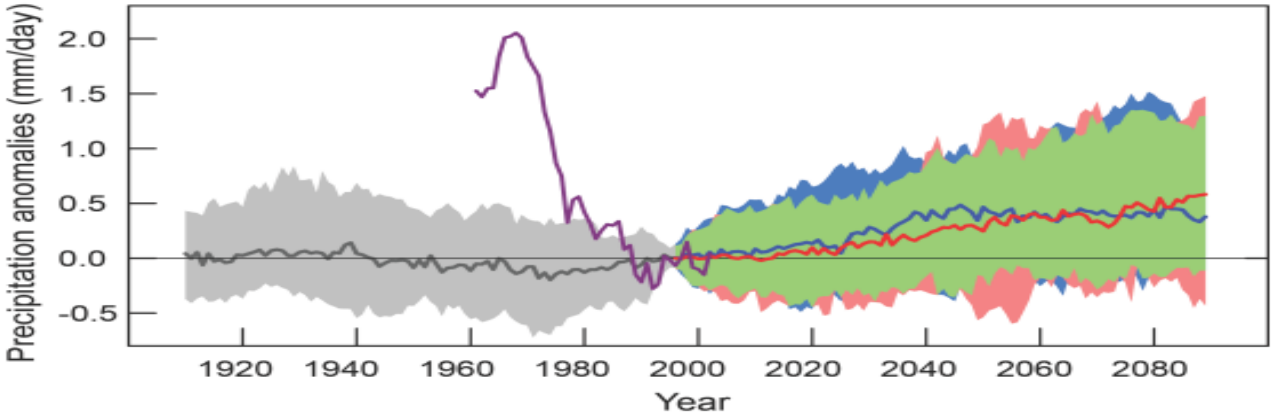
  20thC simulation (1850-2005) with nudging of historical SST in tropical lobe of IPO/PDO

  realizations: 1-3 as 20thC simulation
- **Objective:**

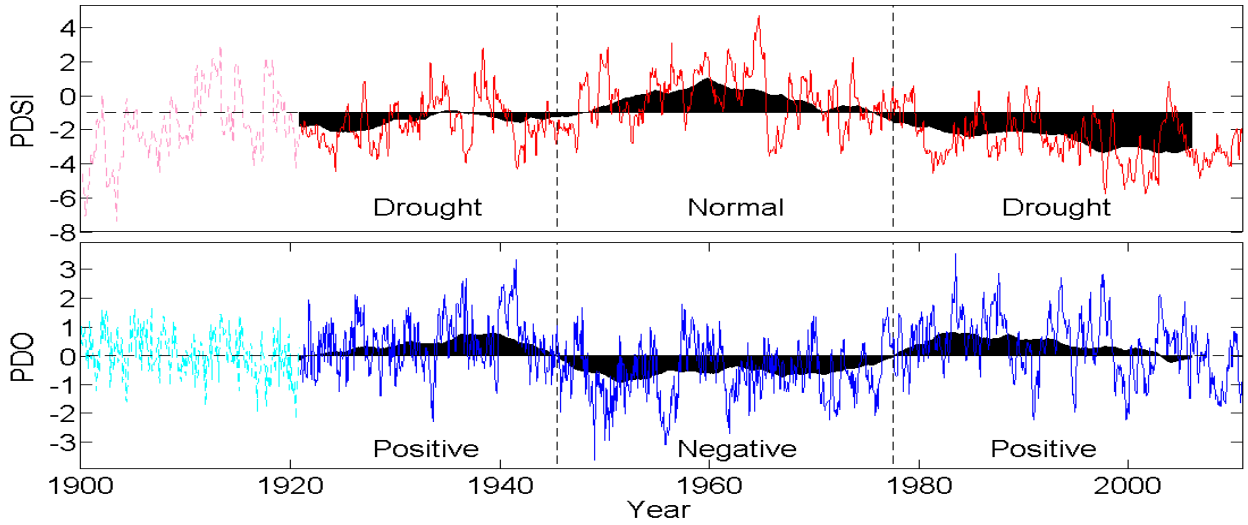
  To understand the roles of natural and anthropogenic forcing (GHG & Aerosol) and internal variability (PDO/IPO) in driving the global monsoon changes
- **Relation to WCRP GCs:**

  Regional climate information, Water availability, and Extremes

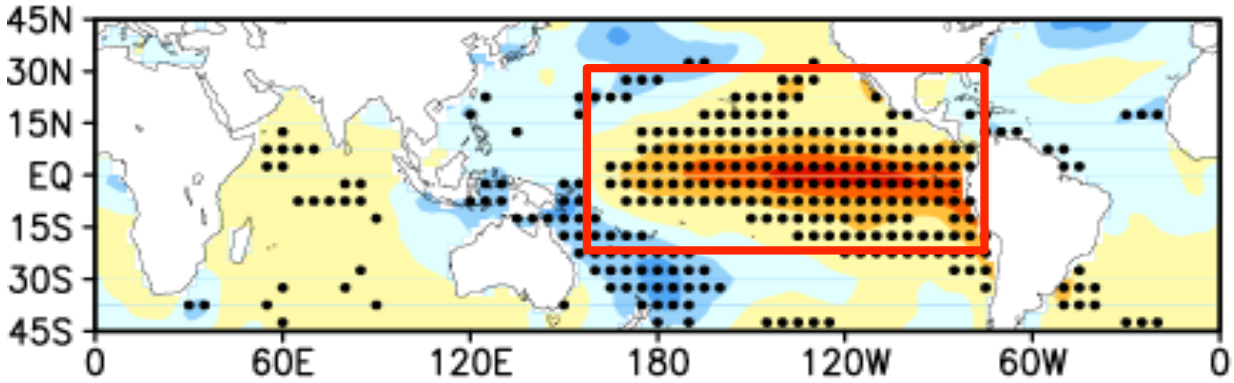
Global monsoons were driven by PDO



Monsoon rainfall in 39 CMIP5 models



Monsoon driven by PDO



Tear-1:
PDO-SST nudging
+
20thC historical run

LASG

http://www.lasg.ac.cn/staff/ztj

THANKS

GMMIP: Global Monsoons Model Inter-comparison Project

- **Sponsors:** **CLIVAR AAMP , GEWEX-CLIVAR MP & CLIVAR C20C**
- **Motivation:** **To improve our understanding on how to reliably simulate the mean state, interannual variability and long-term change of global monsoons.**
- **Tasks : (DECK + CORE + a limited sets of EXPs)**

1) 20th century changes: natural and anthropogenic forcing (GHG & Aerosol) + nudging of PDO/IPO and AMO related historical SST

*150*2*3*

2) Interannual variability: Pacemaker experiments to identify the forcing from EP, WP and TIO *(35*3*3)*

3) The forcing of TP: with/without TP *35*2*

4) High resolution modeling of monsoon rainband:

share data of HighResMIP, no additional exp is needed