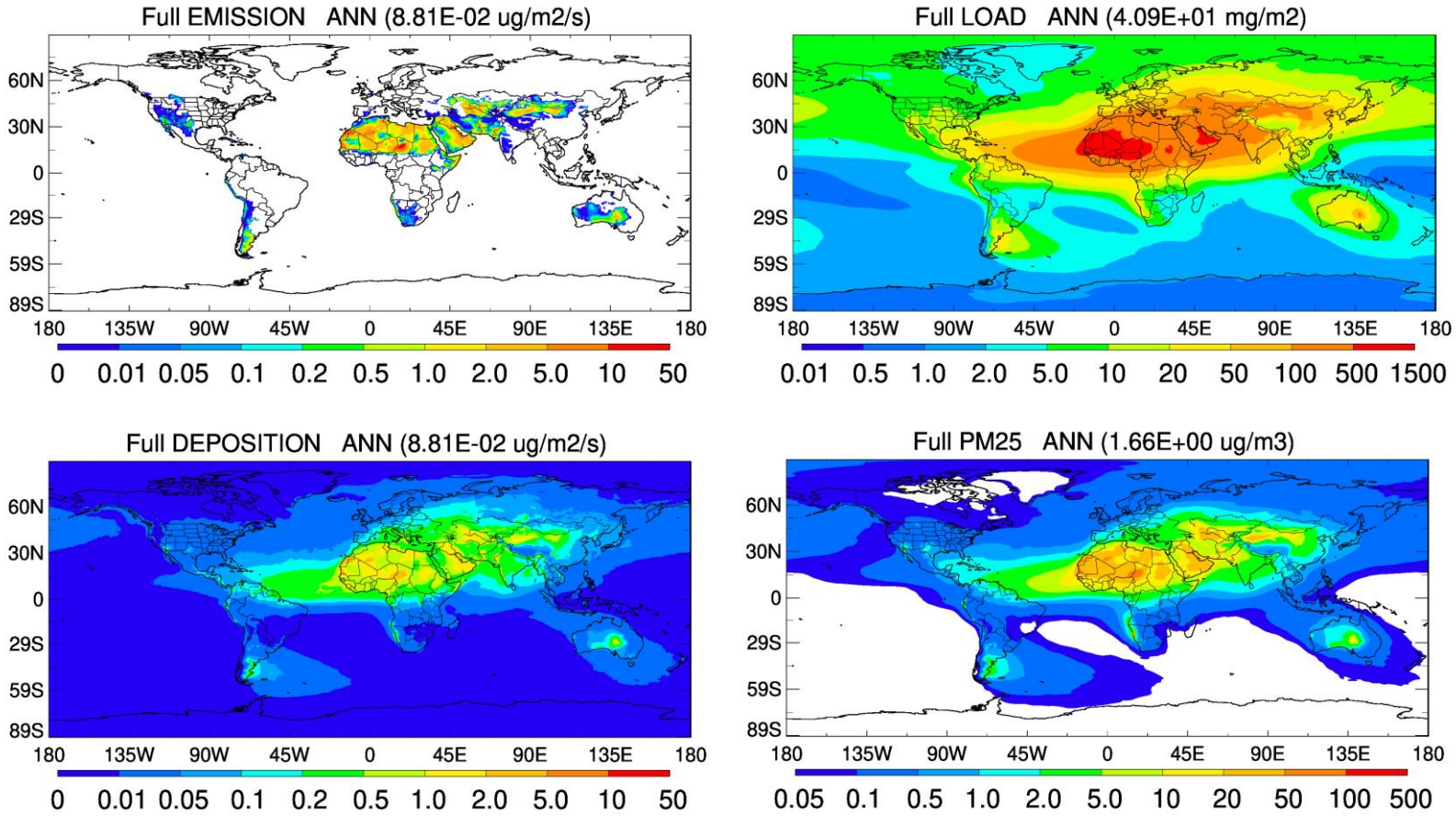
AEROCOM3/DUSA

October 12, 2020

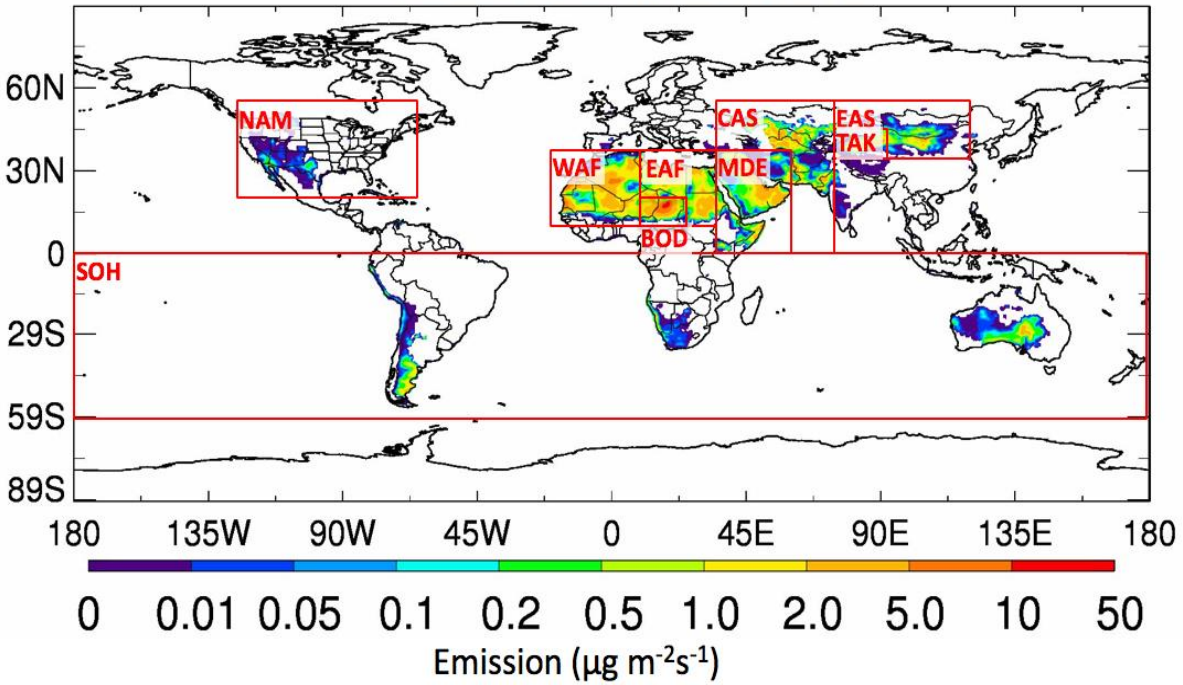
Dongchul Kim, Mian Chin, Greg Schuster, Toshihiko Takemura, Paolo Tuccella, and others

An example of typical global simulation results from GEOS:

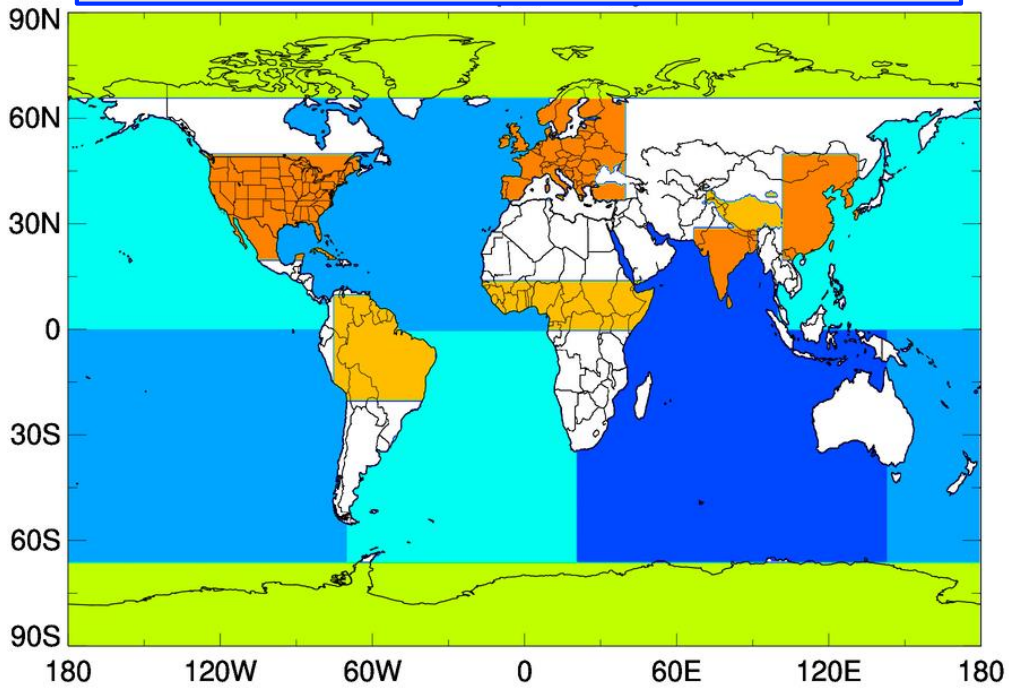


In addition to this typical global model analysis, our focus in DUSA experiment is to quantitatively estimate the contributions of various sources.

Source regions (9)

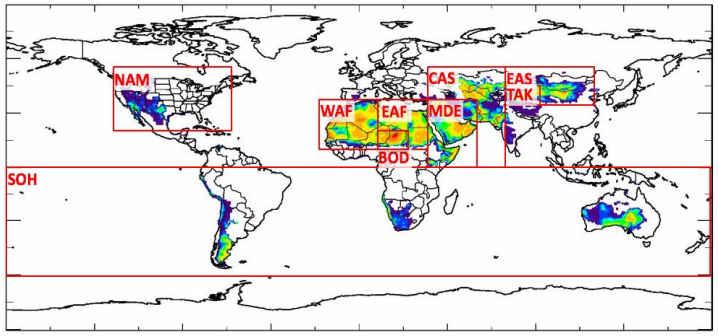


Receptor regions (14)



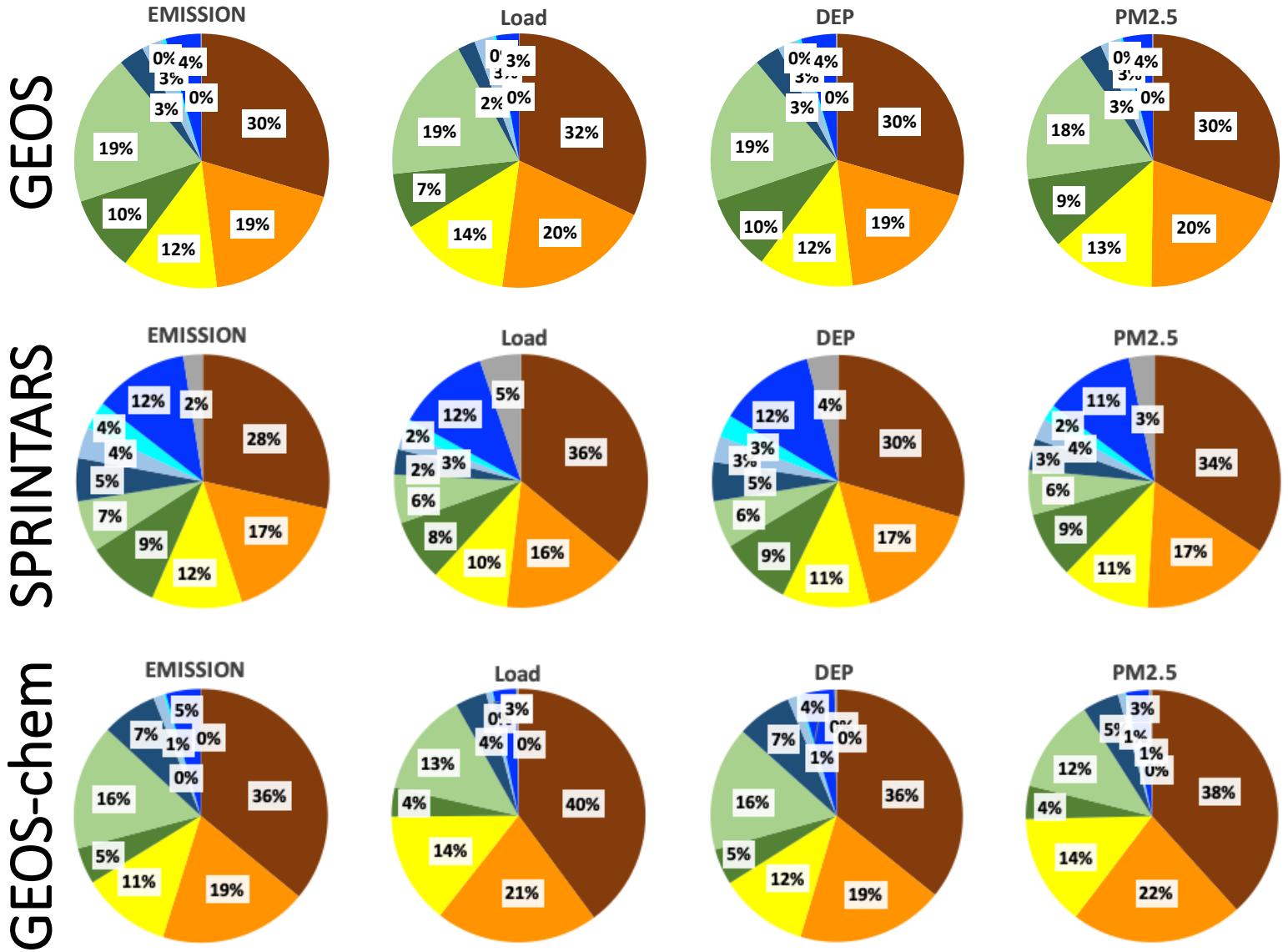
- Source regions (9)
- Receptor regions (14)
- Participating models (5): GEOS, SPRINTARS, GEOS-chem, GISS, CESM2
- DOD 10um is included (special experiment)
- Period: 4 years (2009-2012)

Source contribution in global scale (annual)



WAF EAF BOD CAS MDE
EAS TAK NAM SOH ROW

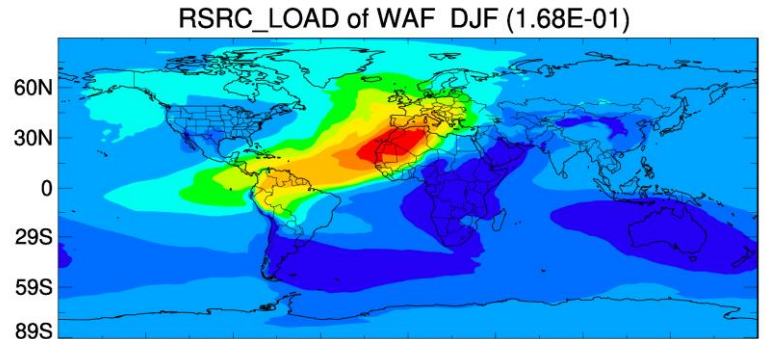
	Unit	GEOS	SPRINTARS	GEOS-chem
EMI	Tg yr^{-1}	1417	2278	1130
LOAD	Tg yr^{-1}	20.8	22.7	21.9
DEP	Tg yr^{-1}	1418	2084	1132
PM2.5	μgm^{-3}	1.6	1.0	2.1



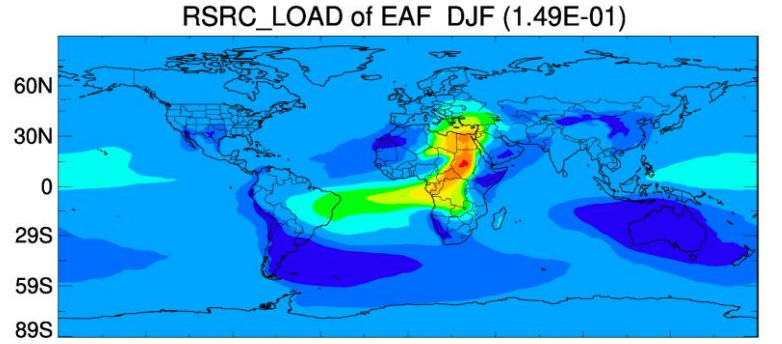
RSRC of African Dust (DJF)

GEOS

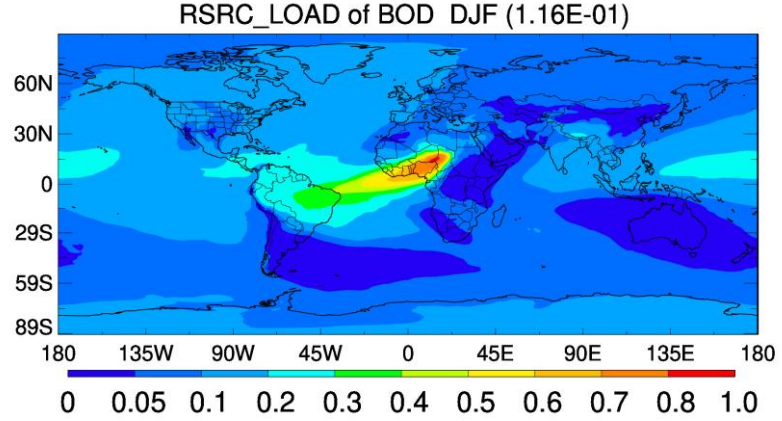
WAF

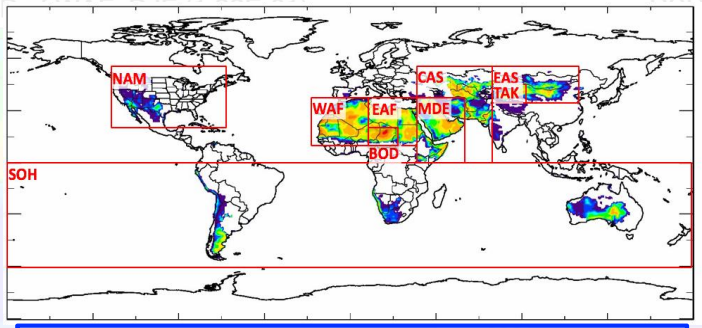


EAF



BOD



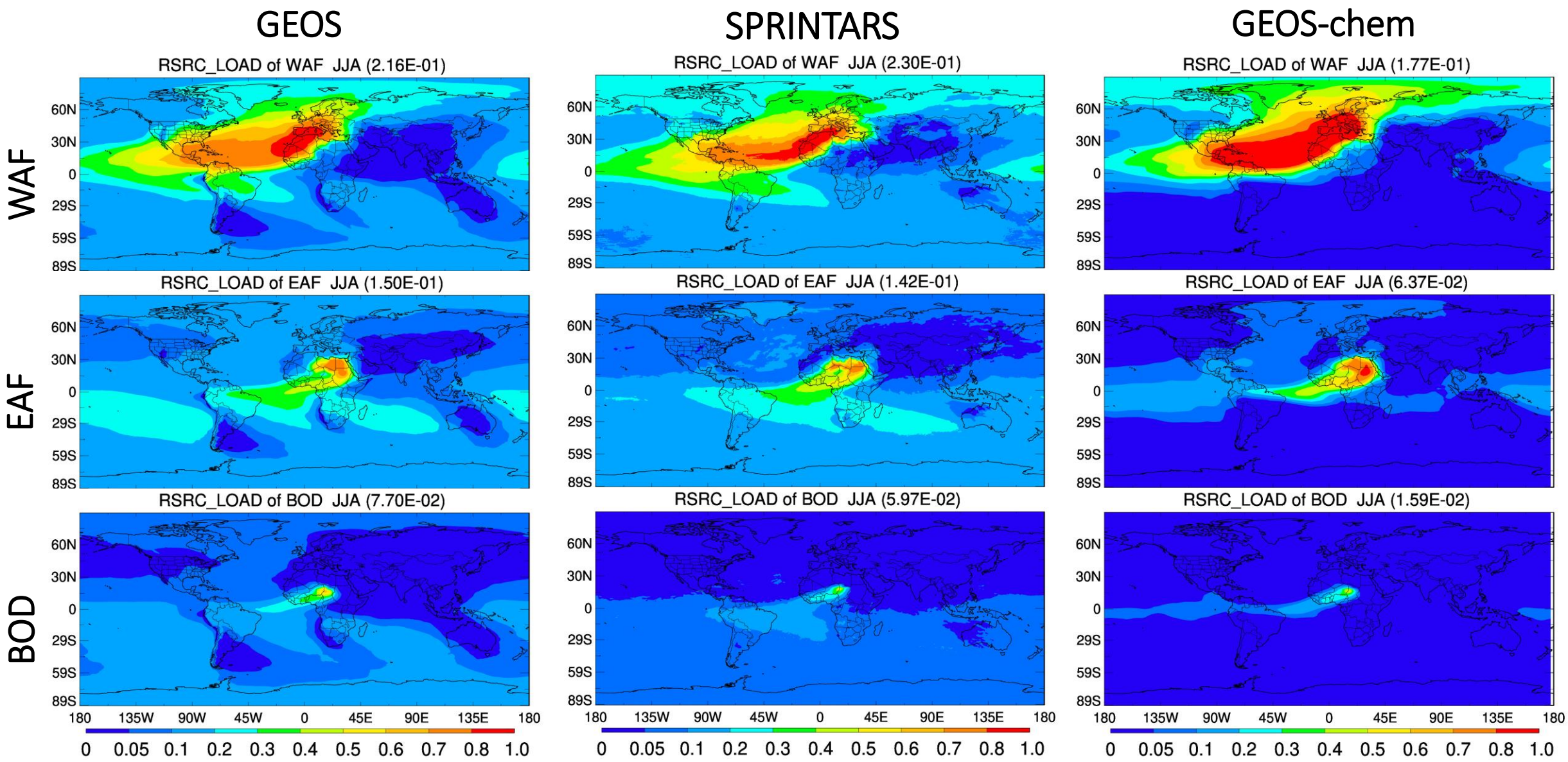


Relative Source contribution:

RSRC = Tag/Base (0 < RSRC < 1)

High RSRC: Source dominant
Low RSRC: Source negligible

RSRC of African Dust (JJA)



Summary and Plan

- DUSA experiment provides estimations of source contribution in various fields including LOAD, PM2.5, and DEP.
- Significant differences in RSRC is found between models
- Another major goals is global map of source attribution, using Aerocom model ensemble.
- We need more model participation.
- Thanks!

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(**Du**st **S**ource **A**ttribution)

Aerocom meeting, October 13, 2020

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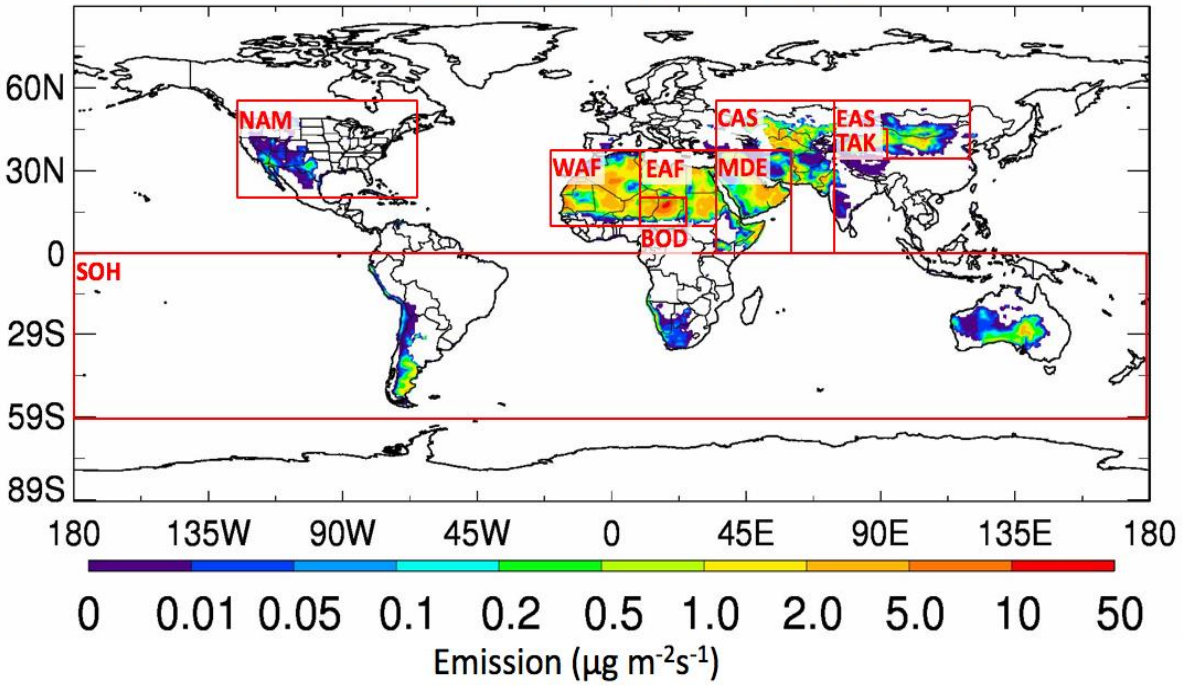

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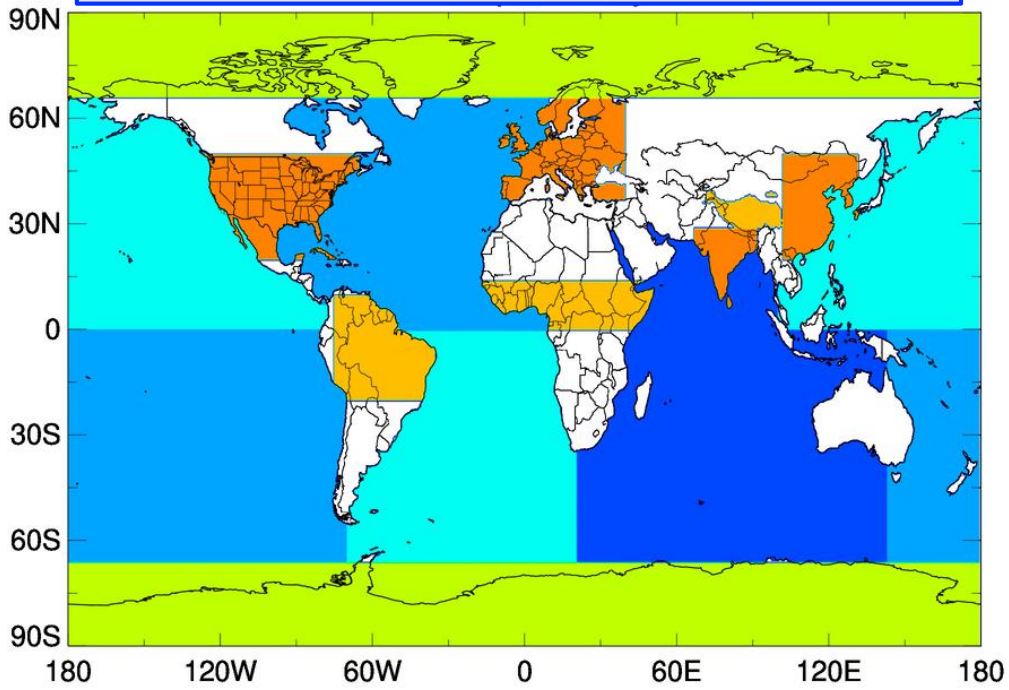

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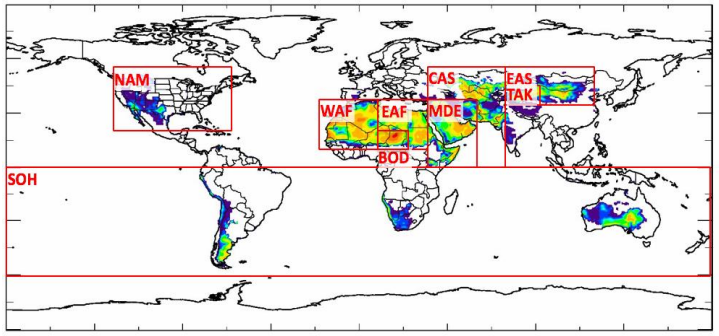

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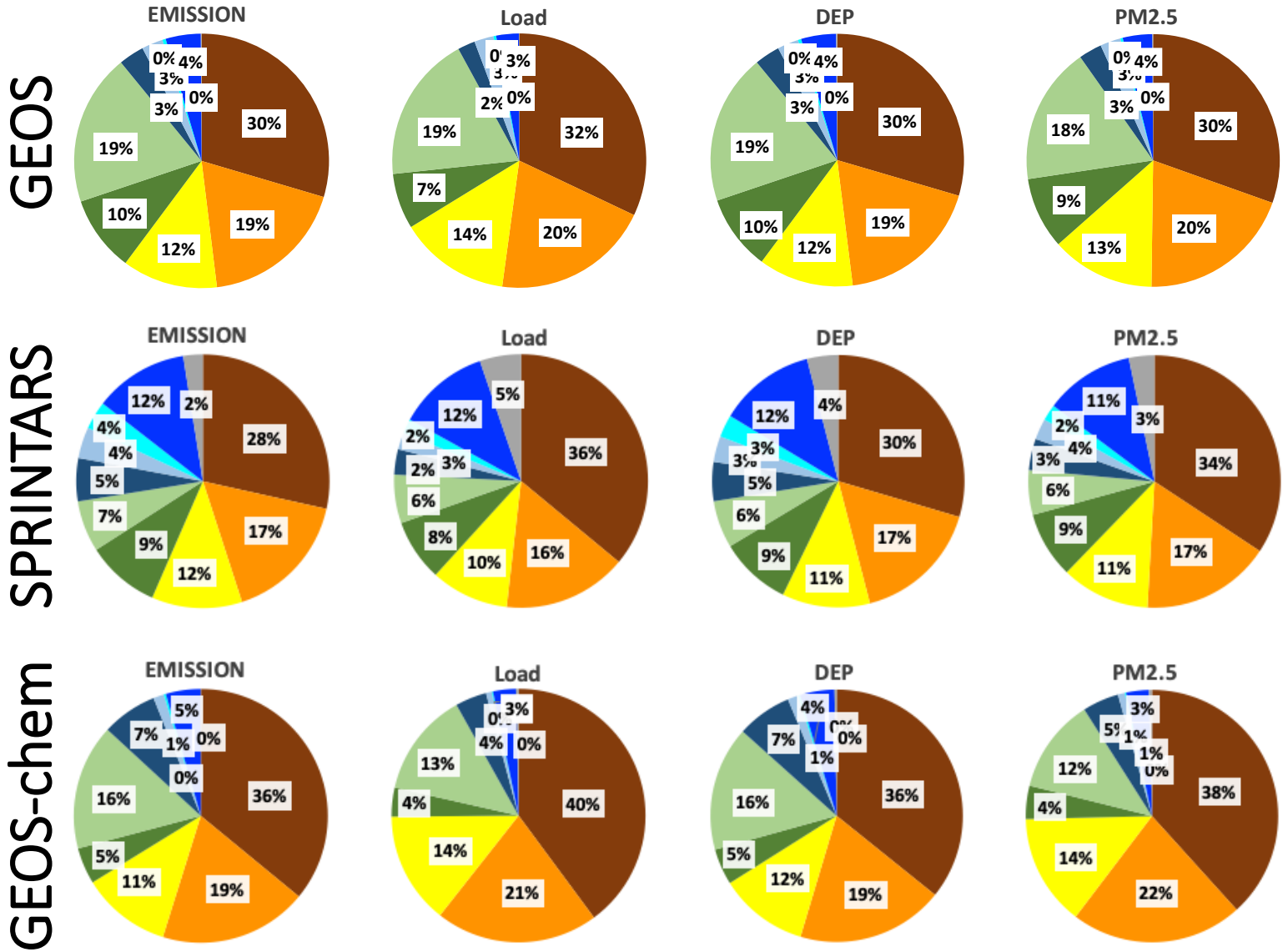
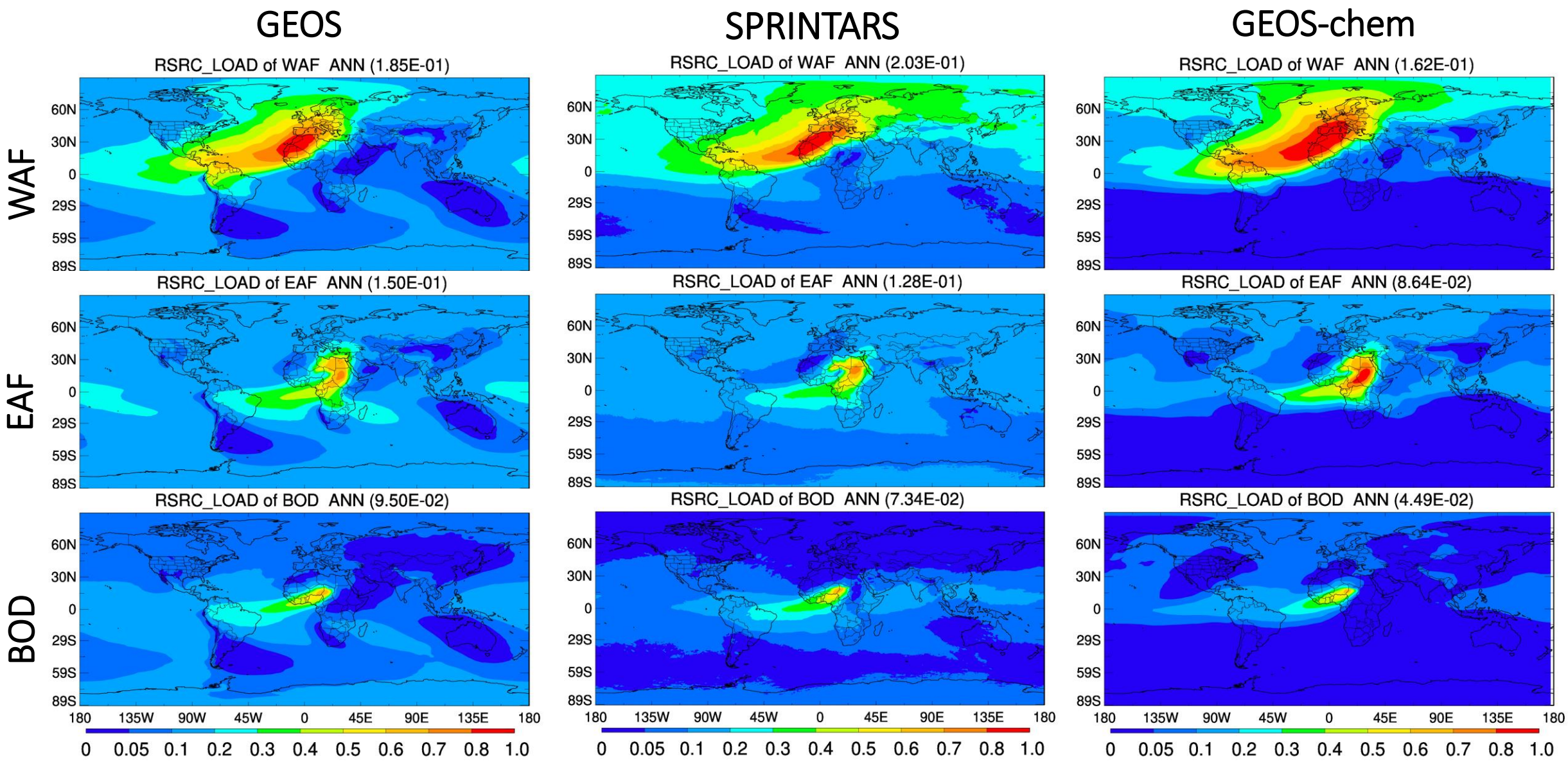
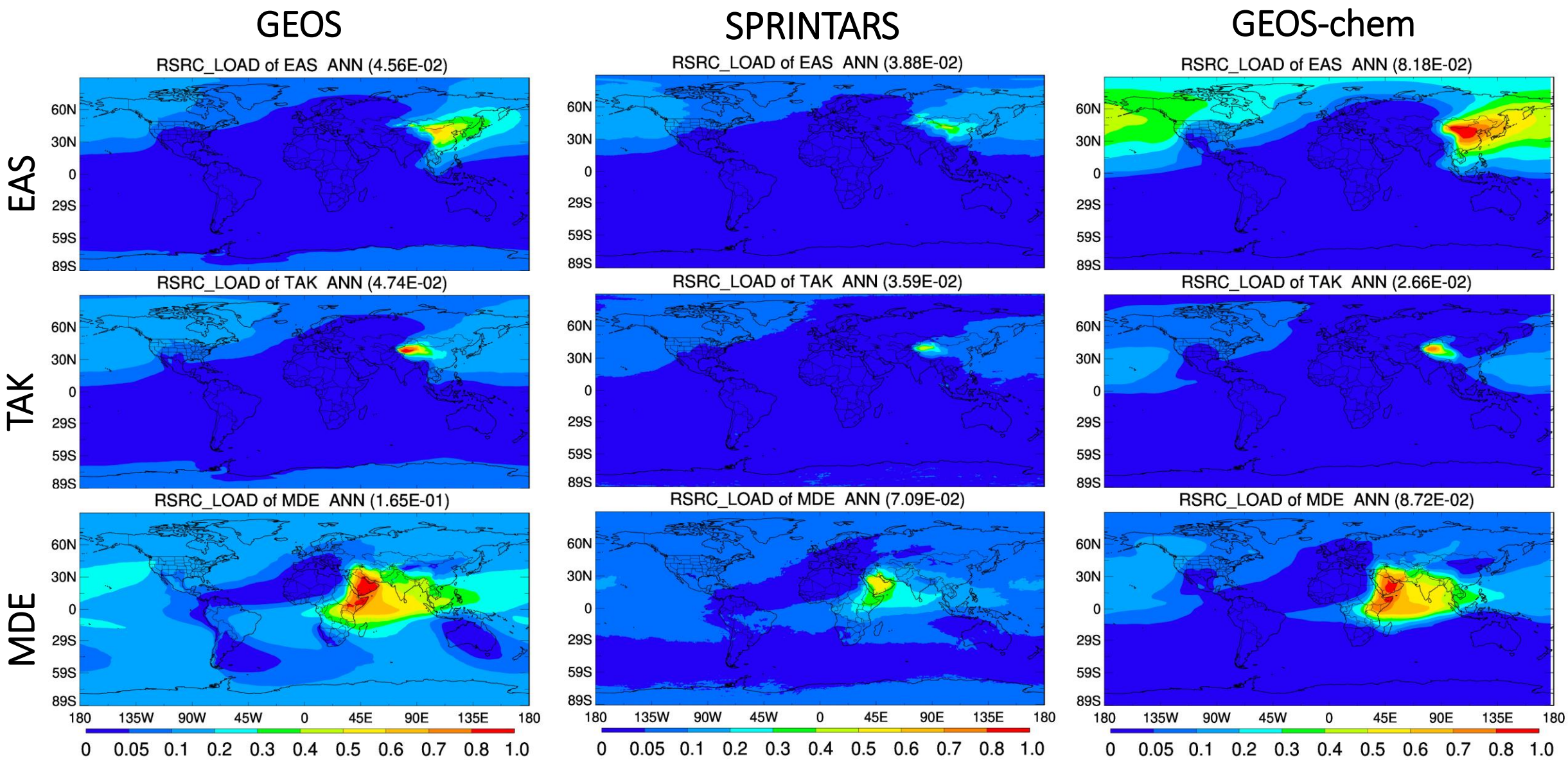


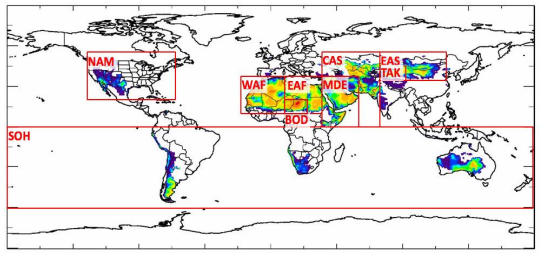
RSRC of Dust from WAF, EAF, and BOD (Annual)



RSRC of Dust from EAS, TAK, and MDE (Annual)



RSRC over various regions



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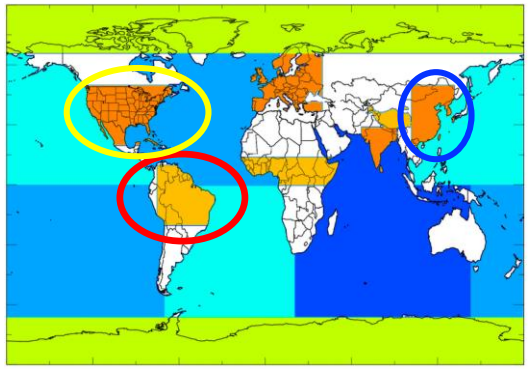
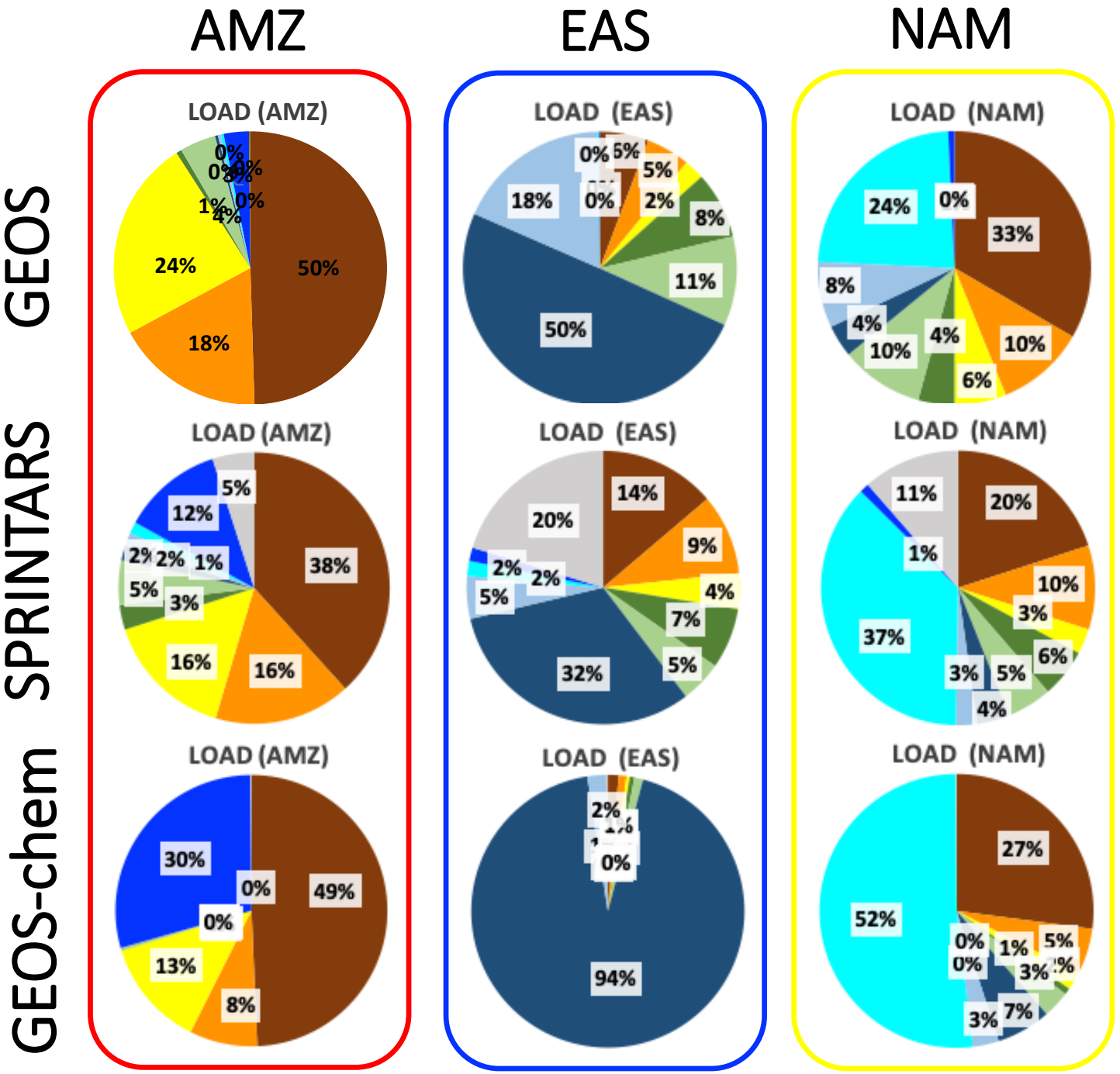
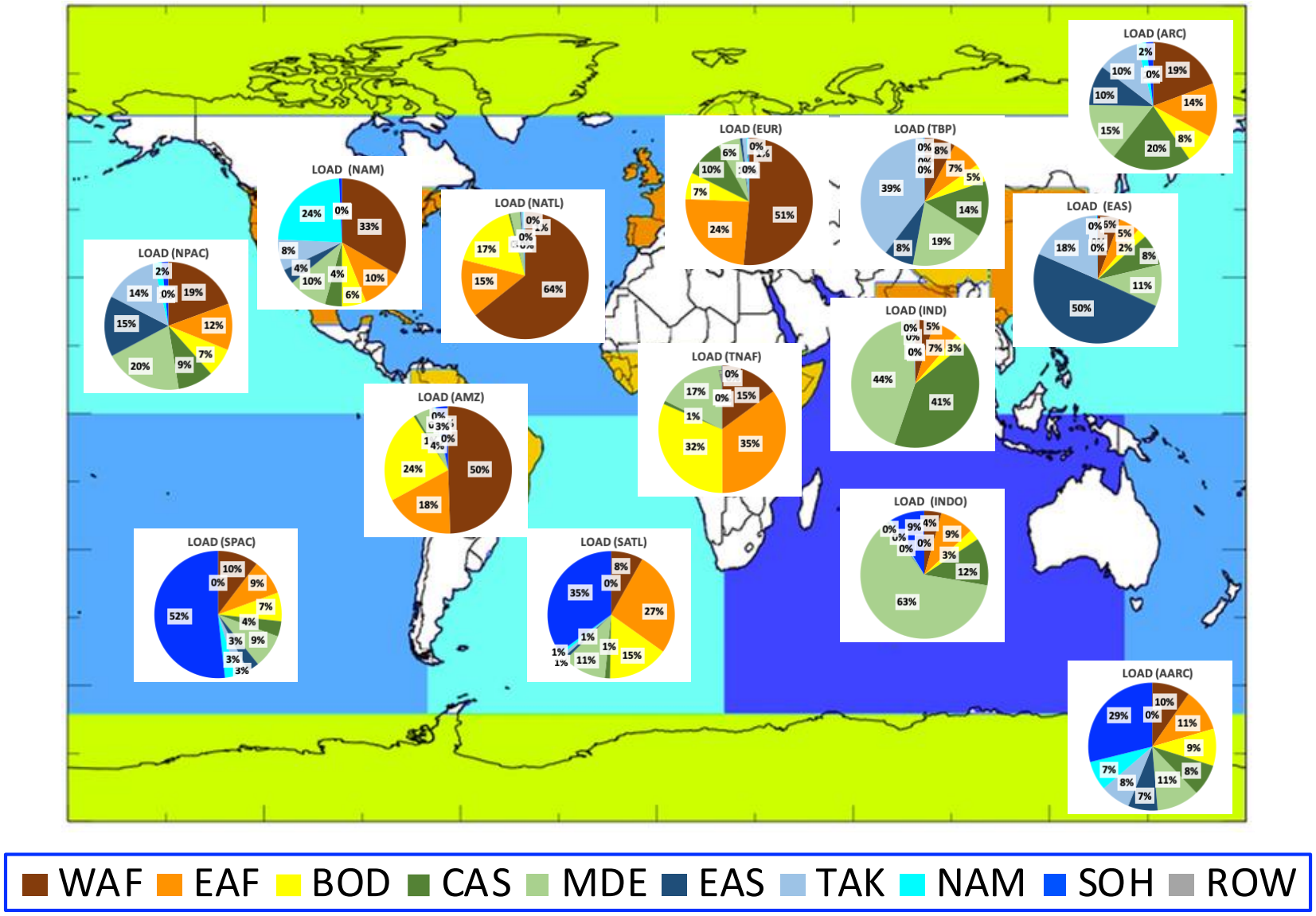




LOAD: Contribution of sources from GEOS



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