

**(a) MPI communicator structure for AWI-CM**

0	1	2	3	4	5
0	1	2	3	0	1

Color legend:

MPI_COMM_WORLD	COMM_CPLMOD
COMM_FESOM	COMM_COUPLE
COMM_ECHAM	COMM_FILTER

**(b) MPI communicator structure of AWI-CM augmented with PDAF for strongly coupled assimilation**

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
0	1	2	3	0	1	0	1	2	3	0	1	0	1	2	3	0	1	0	1	2	3	0	1
0	0	0	0	0	0	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3
0	1	2	3	4	5																		

**(c) Structure of MPI communicator COMM\_FILTER for weakly coupled assimilation**

0	1	2	3	0	1
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