

SUPPLEMENTARY MATERIAL

Solar irradiance component separation benchmarking: the critical role of dynamically-constrained sky conditions

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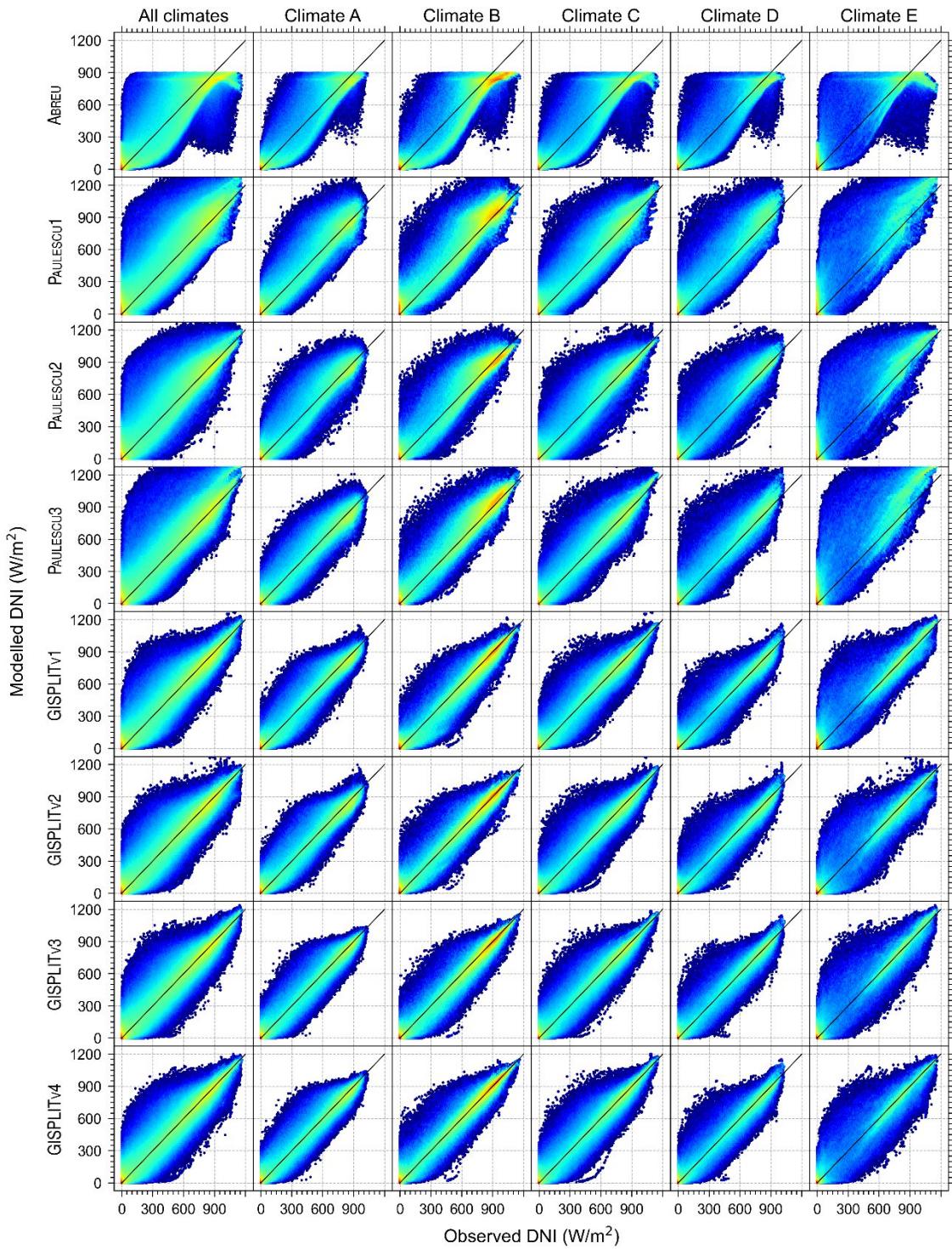


Figure S1. Same as Fig. 1 but for ABREU, PAULESCU1, PAULESCU2, PAULESCU3, and the four GISPLIT versions.

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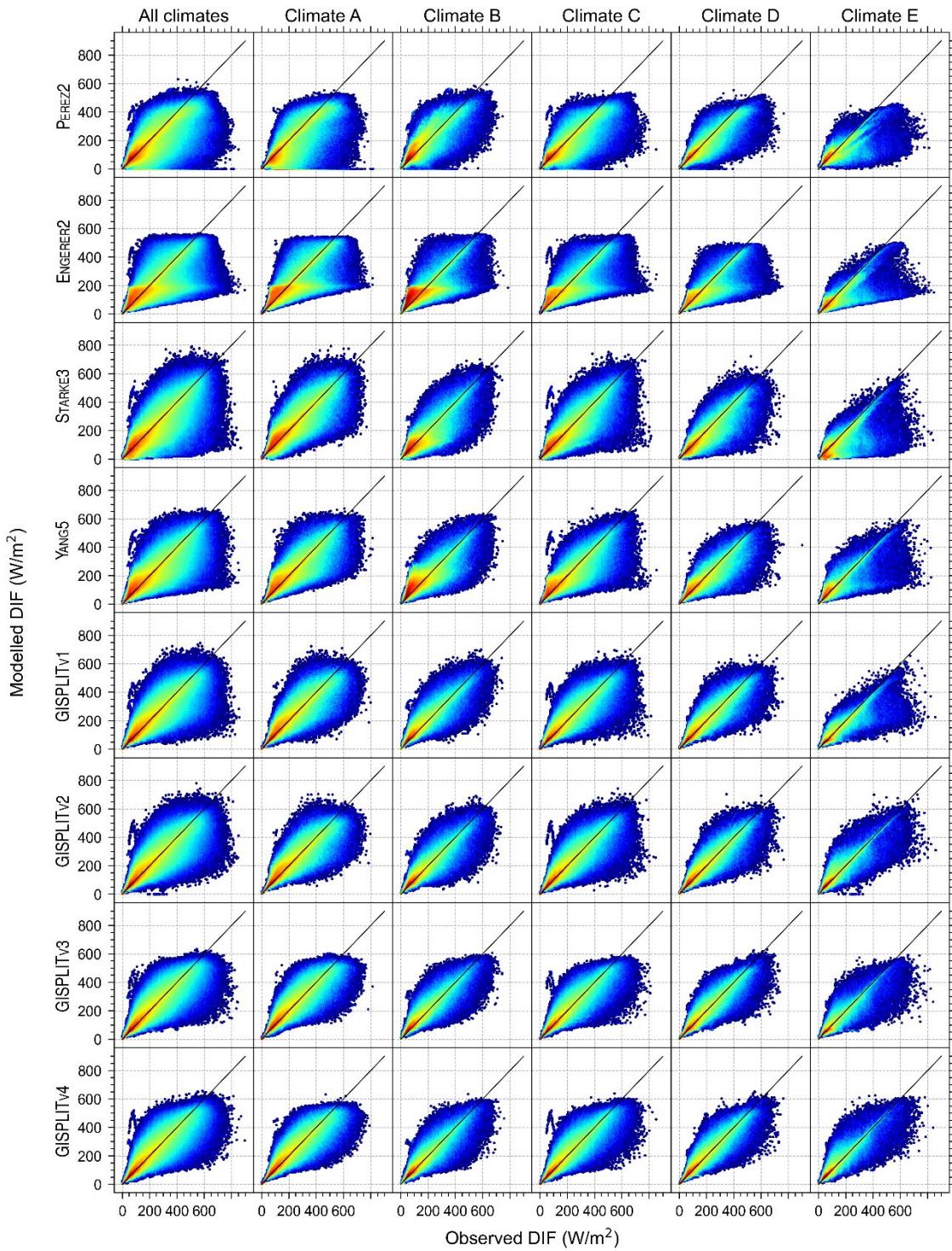


Figure S2. Same as Fig. 1 but for DIF.

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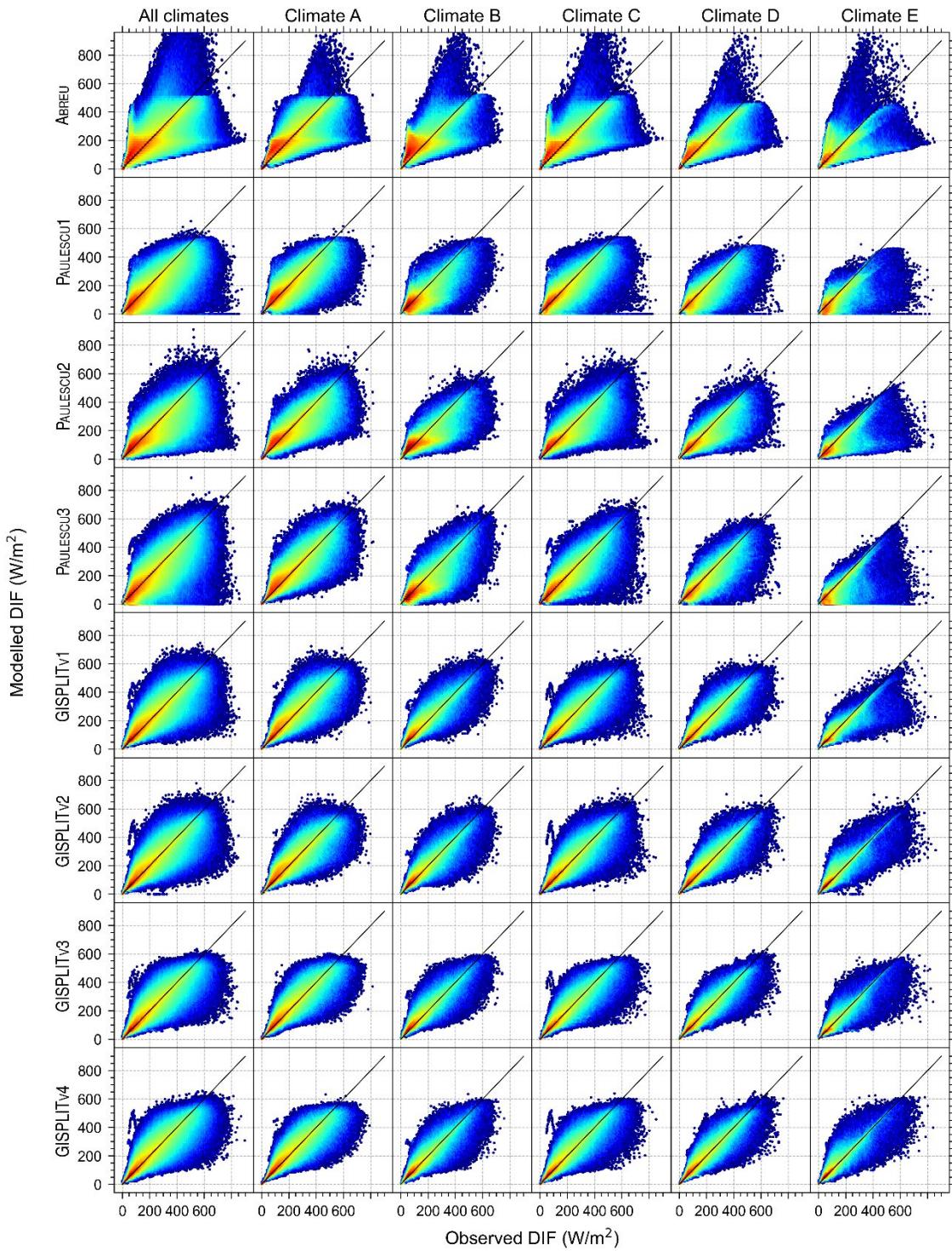


Figure S3. Same as Fig. 1 but for DIF predicted by ABREU, PAULESCU1, PAULESCU2, PAULESCU3, and the four GISPLIT versions.

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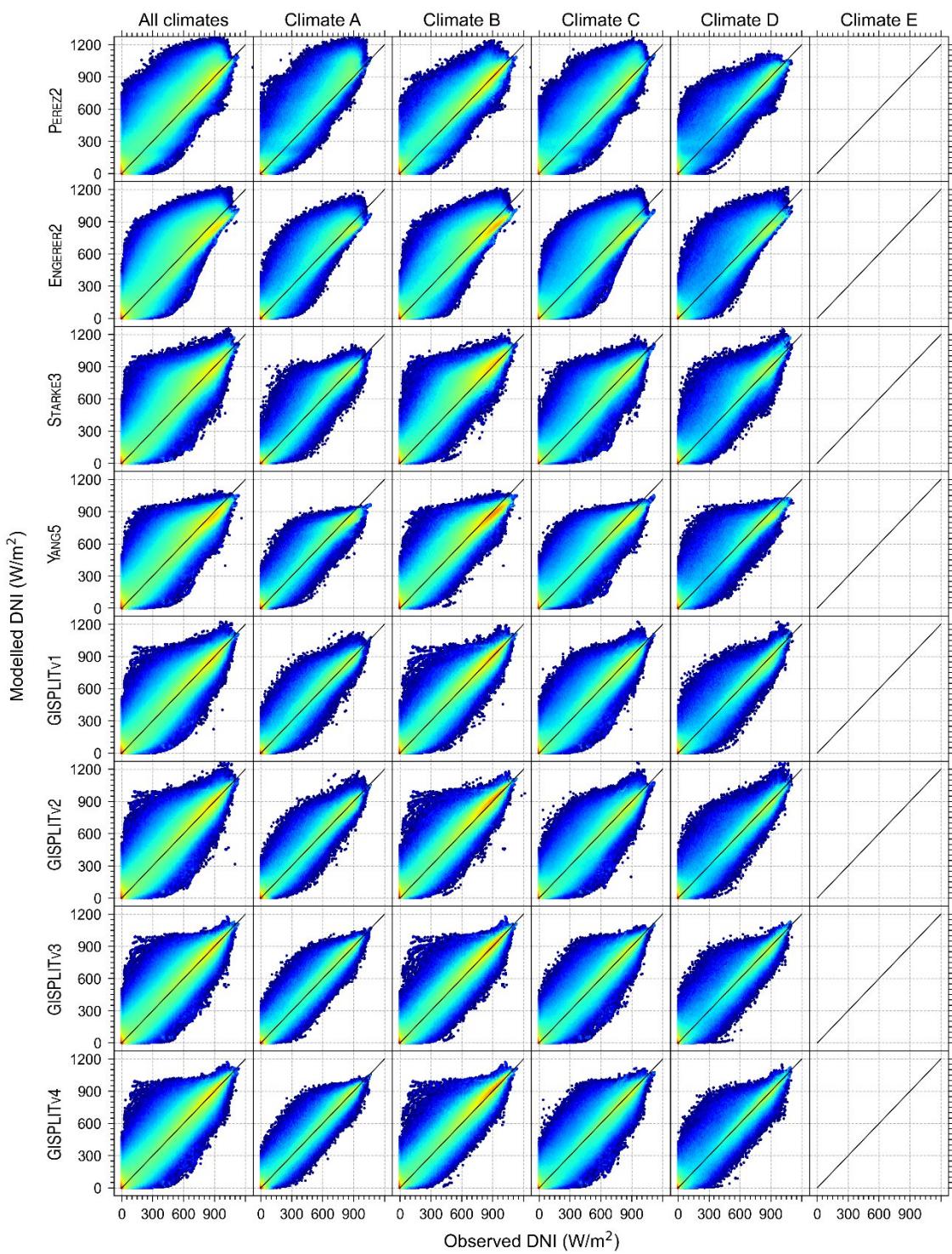


Figure S4. Same as Fig. 1 but for the INDEP dataset.

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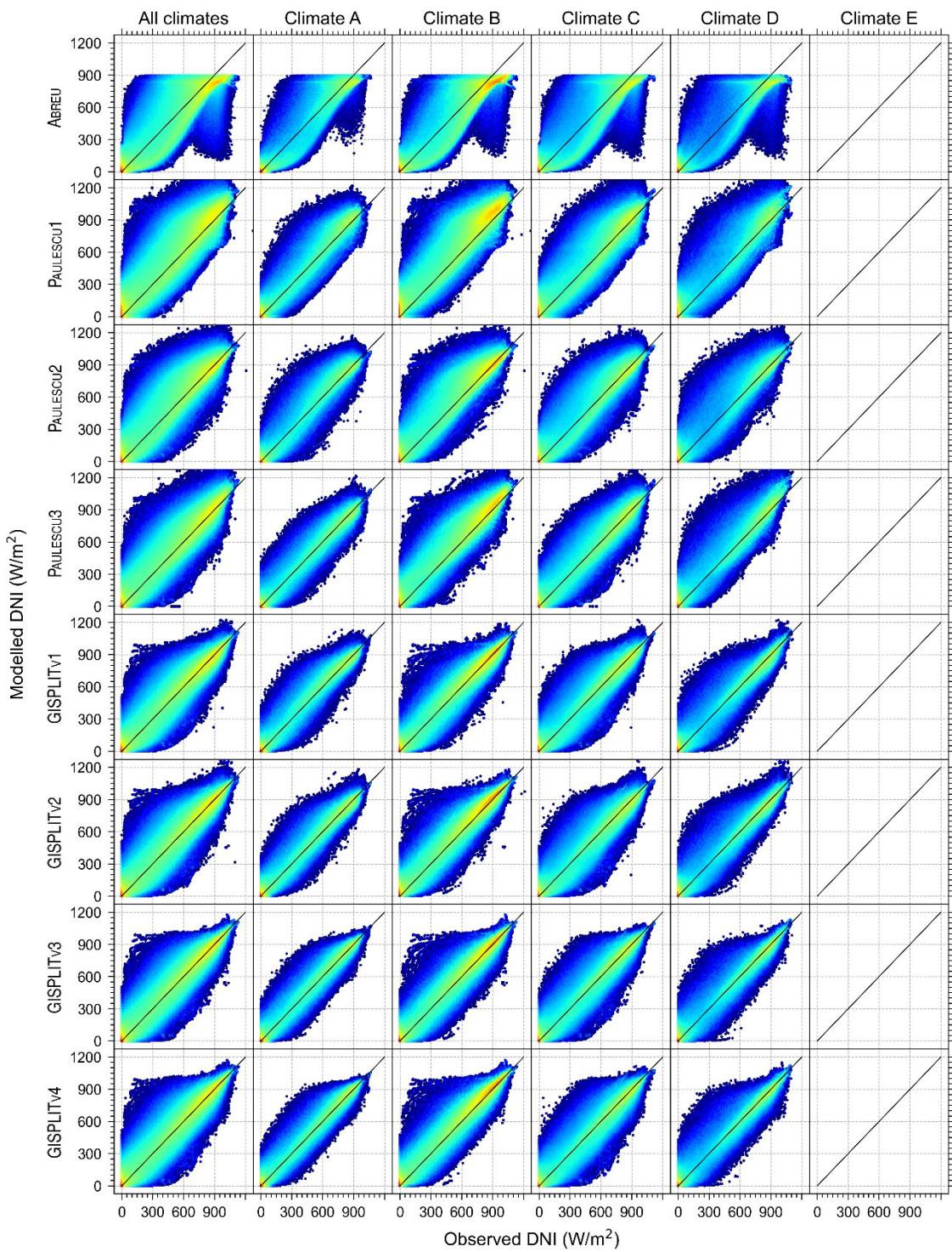


Figure S5. Same as Fig. 1 but using the INDEP dataset with ABREU, PAULESCU1, PAULESCU2, PAULESCU3, and the four GISPLIT versions.

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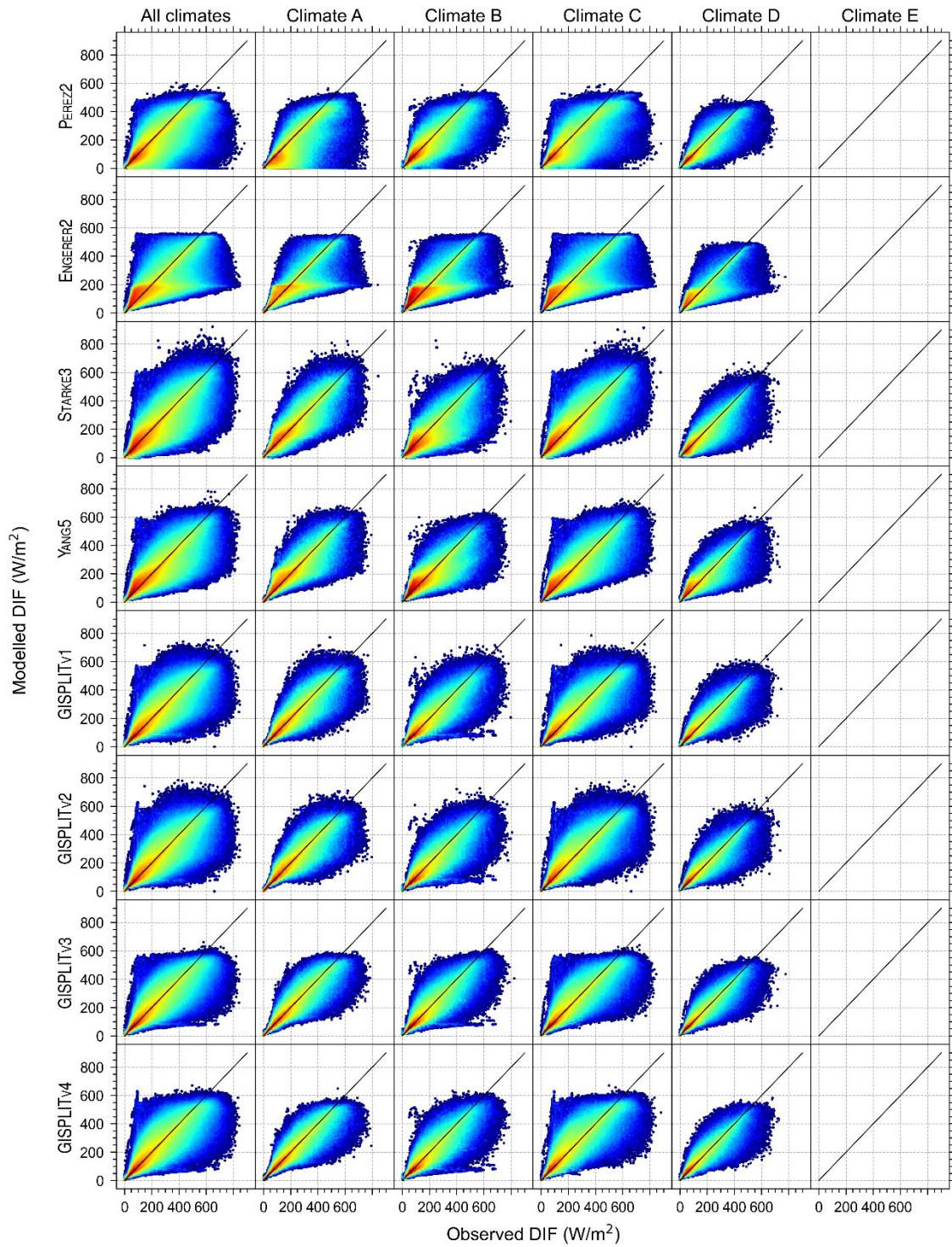


Figure S6. Same as Fig. 1 but for DIF and the INDEP dataset.

SUPPLEMENTARY MATERIAL

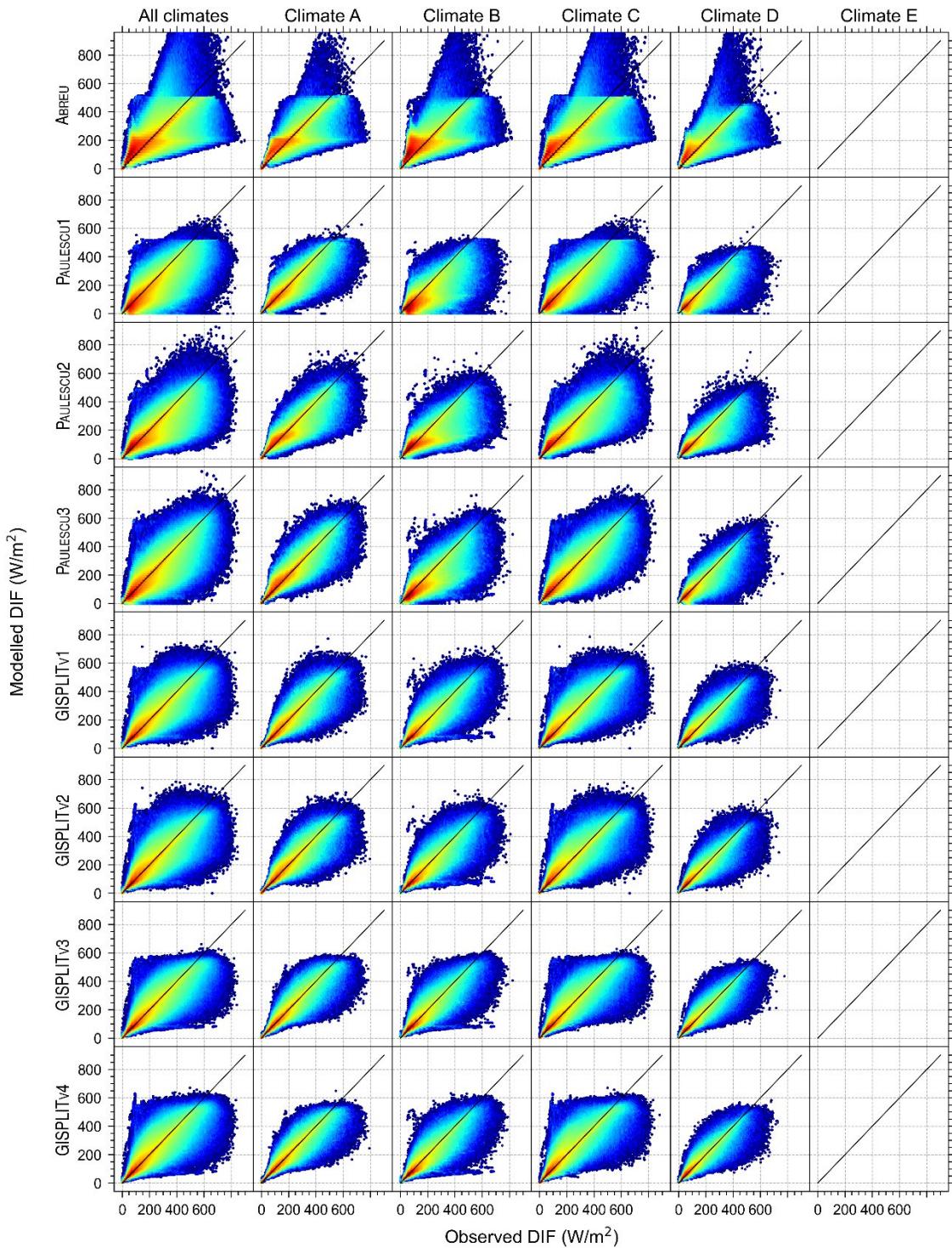


Figure S7. Same as Fig. 1 but for DIF using the INDEP dataset with ABREU, PAULESCU1, PAULESCU2, PAULESCU3, and the four GISPLIT versions.

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Table S1.

Same as Table 3 but for DIF.

	All climates	Climate A	Climate B	Climate C	Climate D	Climate E
PEREZ2	-15.5 (-10.2)	-37.5 (-19.4)	8.0 (6.1)	-14.4 (-9.7)	-15.8 (-9.9)	-19.5 (-15.6)
ENGERER2	-7.3 (-4.8)	-11.6 (-6.0)	9.8 (7.5)	-4.9 (-3.3)	-16.7 (-10.6)	-20.8 (-17.6)
PAULESCU1	-22.2 (-14.6)	-16.4 (-8.5)	-28.4 (-21.5)	-15.7 (-10.6)	-29.5 (-18.6)	-30.2 (-25.5)
ABREU	6.8 (4.5)	-0.4 (-0.2)	29.5 (22.3)	8.0 (5.4)	-6.0 (-3.8)	-3.7 (-3.1)
STARKE3	-10.2 (-6.8)	1.1 (0.5)	-12.2 (-9.3)	-5.3 (-3.6)	-17.5 (-11.0)	-29.3 (-24.9)
YANG4	-4.7 (-3.1)	-3.1 (-1.6)	3.0 (2.2)	-1.9 (-1.3)	-12.0 (-7.6)	-17.2 (-14.5)
PAULESCU2	-13.9 (-9.1)	-11.8 (-6.1)	-11.4 (-8.6)	-8.7 (-5.8)	-20.7 (-13.1)	-26.2 (-22.1)
PAULESCU3	-14.1 (-9.3)	3.2 (1.7)	-22.3 (-17.0)	-8.0 (-5.4)	-20.3 (-12.8)	-37.7 (-32.1)
YANG5	-1.4 (-0.9)	-2.5 (-1.3)	10.2 (7.7)	-2.2 (-1.5)	-10.7 (-6.7)	-3.6 (-3.0)
GISPLITv1	-0.6 (-0.4)	0.5 (0.2)	8.0 (6.0)	-1.1 (-0.7)	-3.1 (-2.0)	-10.3 (-8.7)
GISPLITv2	-0.1 (-0.0)	-1.1 (-0.6)	-0.9 (-0.6)	0.7 (0.5)	0.3 (0.2)	0.5 (0.4)
GISPLITv3	-0.3 (-0.2)	0.9 (0.5)	6.3 (4.8)	-1.5 (-1.0)	-2.6 (-1.6)	-5.8 (-4.9)
GISPLITv4	-0.0 (-0.0)	-1.4 (-0.7)	-1.0 (-0.8)	0.9 (0.6)	0.6 (0.4)	0.5 (0.4)

Table S2.

Same as Table 4 but for DIF.

	All climates	Climate A	Climate B	Climate C	Climate D	Climate E
PEREZ2	-20.9 (-13.2)	-48.3 (-24.8)	-13.1 (-9.1)	-20.2 (-12.1)	-15.1 (-11.0)	- -
ENGERER2	-5.2 (-3.3)	-17.6 (-9.1)	-0.4 (-0.2)	-4.5 (-2.7)	-7.2 (-5.2)	- -
PAULESCU1	-29.7 (-18.6)	-19.9 (-10.3)	-47.0 (-32.6)	-19.7 (-11.8)	-26.1 (-18.8)	- -
ABREU	8.2 (5.2)	-5.0 (-2.6)	15.0 (10.4)	7.6 (4.6)	6.3 (4.5)	- -
STARKE3	-10.1 (-6.3)	-5.0 (-2.6)	-21.2 (-14.8)	-1.6 (-0.9)	-13.0 (-9.4)	- -
YANG4	-3.2 (-2.0)	-11.1 (-5.7)	-4.7 (-3.2)	0.0 (0.0)	-1.2 (-0.8)	- -
PAULESCU2	-16.1 (-10.1)	-16.1 (-8.3)	-23.3 (-16.2)	-10.2 (-6.1)	-16.0 (-11.5)	- -
PAULESCU3	-14.4 (-9.0)	-2.5 (-1.3)	-28.2 (-19.6)	-5.5 (-3.3)	-18.6 (-13.4)	- -
YANG5	-2.1 (-1.3)	-4.6 (-2.4)	-3.7 (-2.5)	0.3 (0.2)	-2.5 (-1.8)	- -
GISPLITv1	-4.9 (-3.1)	-9.5 (-4.9)	-5.9 (-4.1)	-3.0 (-1.8)	-3.3 (-2.4)	- -
GISPLITv2	-5.1 (-3.2)	-8.2 (-4.2)	-12.5 (-8.7)	1.7 (1.0)	-4.0 (-2.9)	- -
GISPLITv3	-5.0 (-3.2)	-7.4 (-3.8)	-6.6 (-4.6)	-3.4 (-2.1)	-3.5 (-2.5)	- -
GISPLITv4	-4.7 (-2.9)	-8.7 (-4.5)	-12.0 (-8.3)	2.2 (1.3)	-2.9 (-2.1)	- -

Table S3.

Same as Table 5 but for DIF.

	All climates	Climate A	Climate B	Climate C	Climate D	Climate E
PEREZ2	65.7 (42.9)	90.4 (46.8)	54.7 (41.7)	57.8 (39.0)	54.7 (34.5)	65.5 (52.4)
ENGERER2	66.0 (43.5)	76.5 (39.5)	65.1 (49.4)	62.3 (42.0)	64.6 (40.9)	60.4 (51.1)
PAULESCU1	69.2 (45.6)	74.5 (38.5)	70.8 (53.7)	62.4 (42.1)	72.8 (46.0)	70.8 (59.9)
ABREU	72.2 (47.6)	74.8 (38.7)	78.4 (59.4)	70.8 (47.7)	63.2 (39.9)	72.4 (61.1)
STARKE3	55.9 (36.9)	61.1 (31.5)	54.5 (41.7)	48.6 (32.7)	55.0 (34.7)	67.3 (57.3)
YANG4	57.3 (37.6)	64.5 (33.2)	55.9 (42.1)	53.4 (35.8)	56.2 (35.4)	58.7 (49.6)
PAULESCU2	61.5 (40.6)	68.6 (35.5)	60.0 (45.5)	55.2 (37.2)	62.8 (39.7)	66.0 (55.8)
PAULESCU3	59.9 (39.6)	62.5 (32.3)	59.1 (45.2)	50.7 (34.1)	58.7 (37.1)	77.8 (66.2)
YANG5	54.4 (35.7)	62.3 (32.1)	55.9 (42.0)	52.4 (35.1)	52.0 (32.7)	46.7 (39.5)
GISPLITv1	45.1 (29.7)	56.0 (29.0)	41.1 (31.1)	42.3 (28.5)	41.6 (26.3)	43.1 (36.4)
GISPLITv2	43.6 (28.7)	55.5 (28.7)	39.5 (30.0)	41.7 (28.1)	40.7 (25.7)	35.9 (30.3)
GISPLITv3	42.2 (27.8)	52.7 (27.3)	38.7 (29.3)	40.1 (27.0)	39.3 (24.9)	37.0 (31.3)
GISPLITv4	41.3 (27.2)	52.4 (27.1)	37.5 (28.4)	39.7 (26.7)	38.6 (24.4)	33.9 (28.6)

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Table S4

Same as Table 6 but for DIF.

	All climates	Climate A	Climate B	Climate C	Climate D	Climate E
PEREZ2	68.4 (43.0)	98.6 (50.7)	55.4 (38.6)	70.4 (42.2)	51.6 (37.4)	— —
ENGERER2	68.5 (42.9)	75.7 (38.9)	66.8 (46.4)	70.1 (41.9)	58.7 (42.3)	— —
PAULESCU1	72.0 (45.2)	66.1 (34.0)	83.1 (57.7)	65.7 (39.3)	65.7 (47.3)	— —
ABREU	72.2 (45.2)	73.1 (37.6)	73.2 (50.9)	72.7 (43.5)	66.2 (47.7)	— —
STARKE3	56.3 (35.3)	57.0 (29.3)	60.8 (42.3)	54.0 (32.3)	49.2 (35.6)	— —
YANG4	56.9 (35.4)	64.2 (32.9)	57.6 (39.8)	55.8 (33.2)	49.4 (35.5)	— —
PAULESCU2	62.6 (39.2)	64.2 (33.0)	67.1 (46.6)	59.8 (35.7)	57.2 (41.1)	— —
PAULESCU3	57.3 (35.9)	54.2 (27.9)	63.3 (44.0)	53.6 (32.0)	54.9 (39.7)	— —
YANG5	54.5 (34.0)	58.6 (30.0)	54.1 (37.4)	54.7 (32.5)	49.7 (35.6)	— —
GISPLITv1	48.6 (30.4)	55.2 (28.4)	44.1 (30.7)	51.6 (30.9)	41.6 (30.0)	— —
GISPLITv2	49.4 (31.0)	53.8 (27.7)	45.5 (31.6)	53.0 (31.7)	42.0 (30.2)	— —
GISPLITv3	46.9 (29.4)	51.8 (26.6)	43.0 (29.9)	50.2 (30.0)	39.7 (28.6)	— —
GISPLITv4	48.1 (30.1)	51.2 (26.3)	44.4 (30.8)	52.0 (31.1)	40.0 (28.8)	— —

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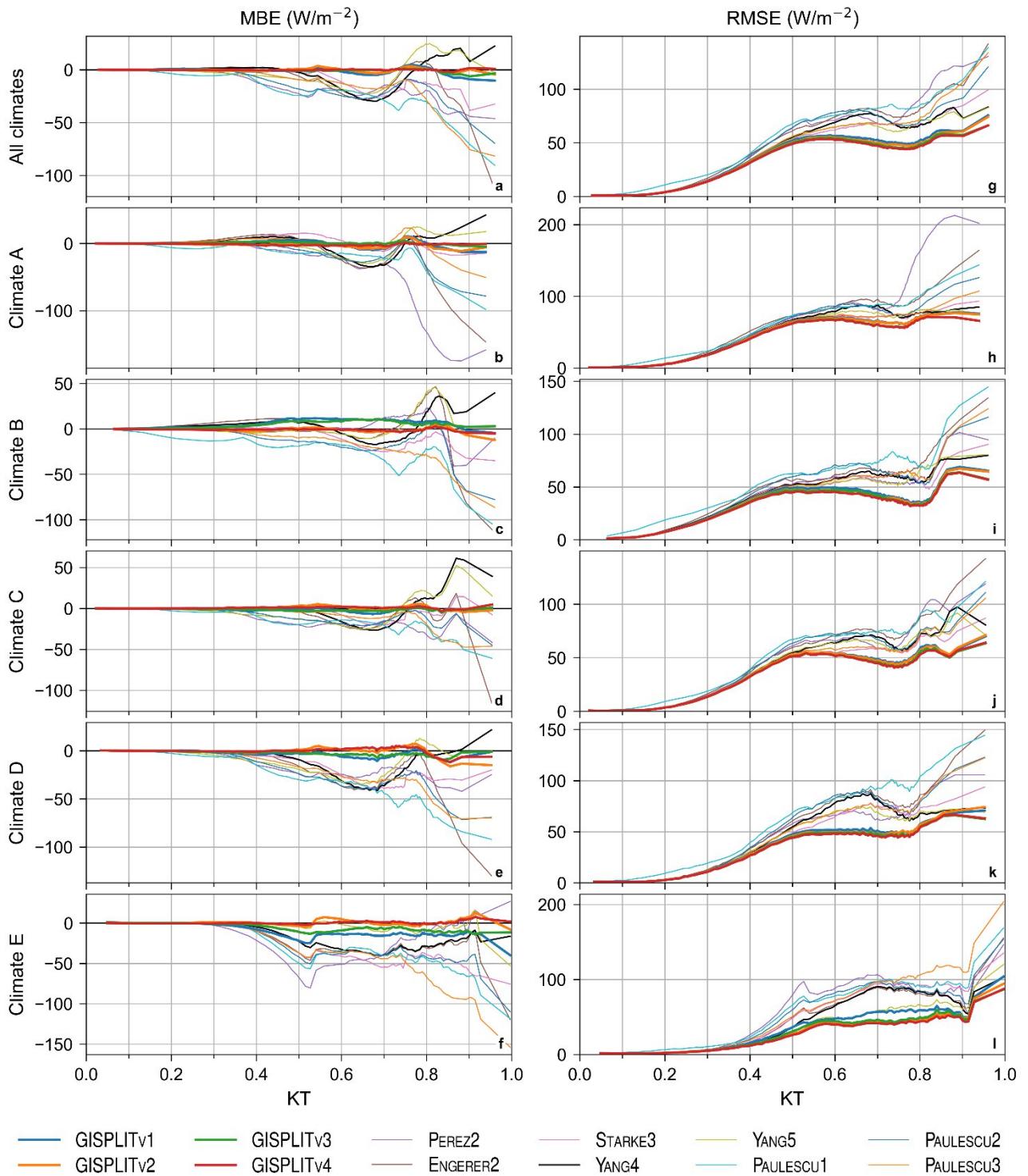


Figure S8. Same as Fig. 3 but for DIF.

SUPPLEMENTARY MATERIAL

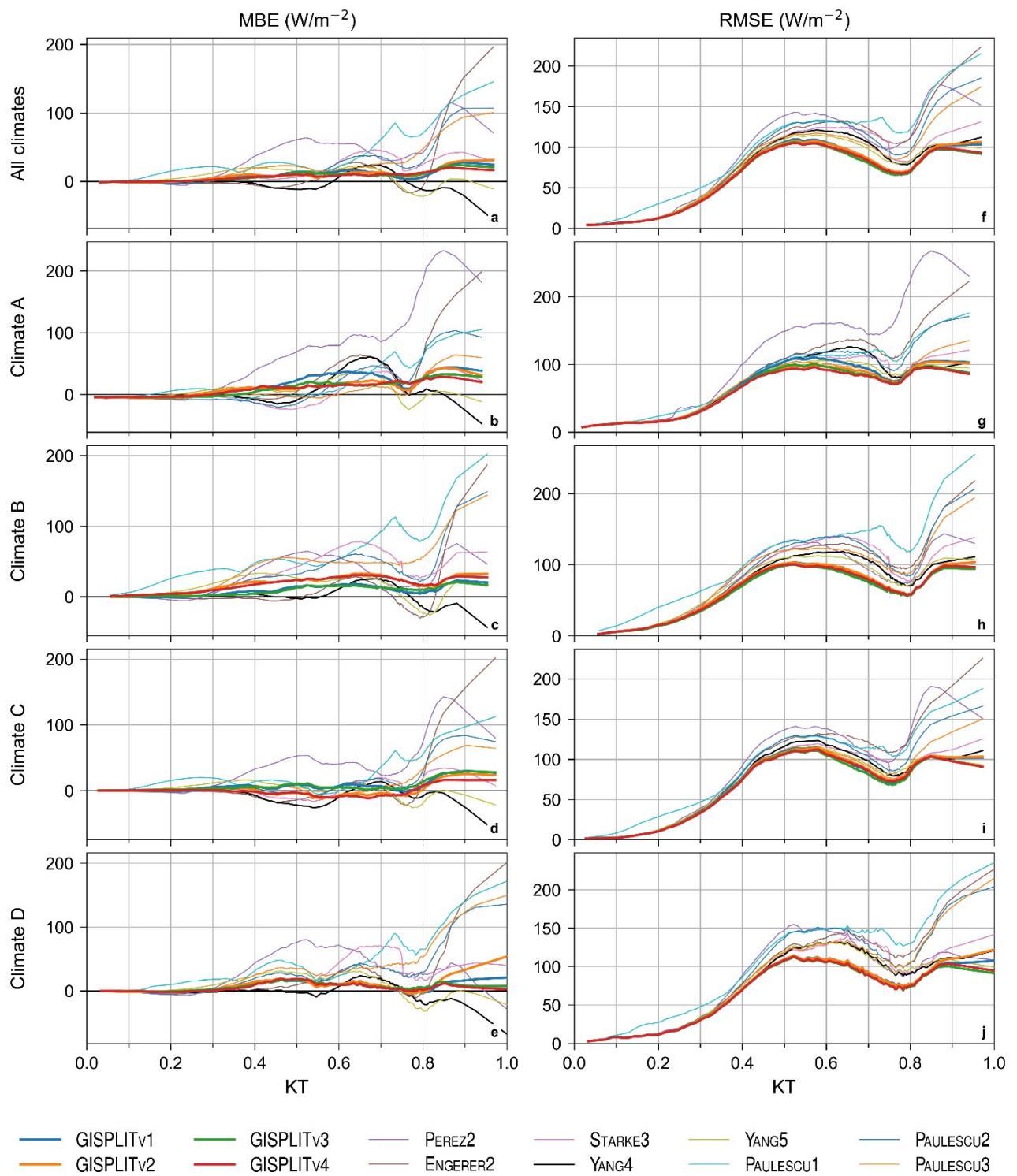


Figure S9. Same as Fig. 3 but for the INDEP dataset.

SUPPLEMENTARY MATERIAL

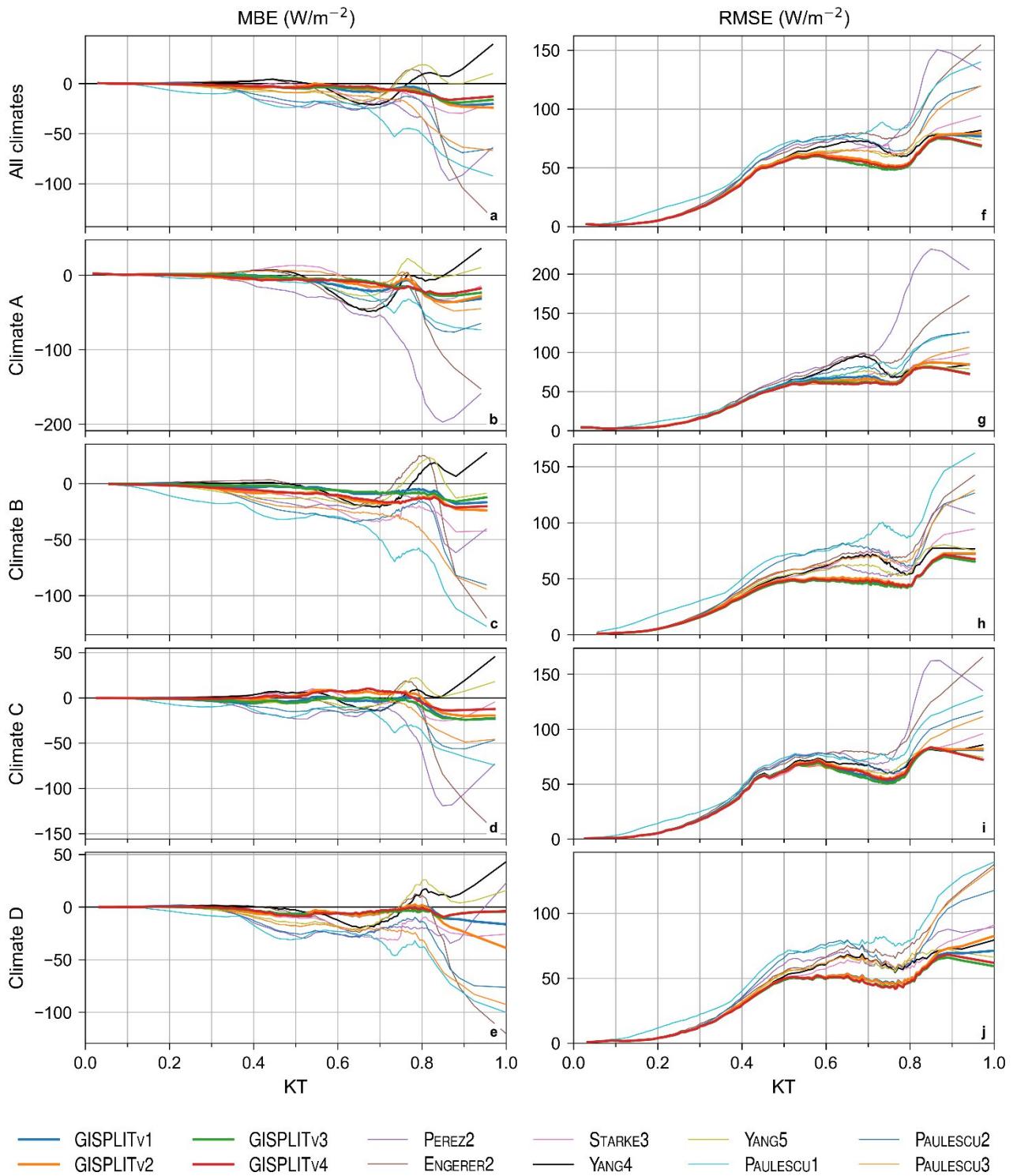


Figure S10. Same as Fig. 3 but for DIF and the INDEP dataset.

SUPPLEMENTARY MATERIAL

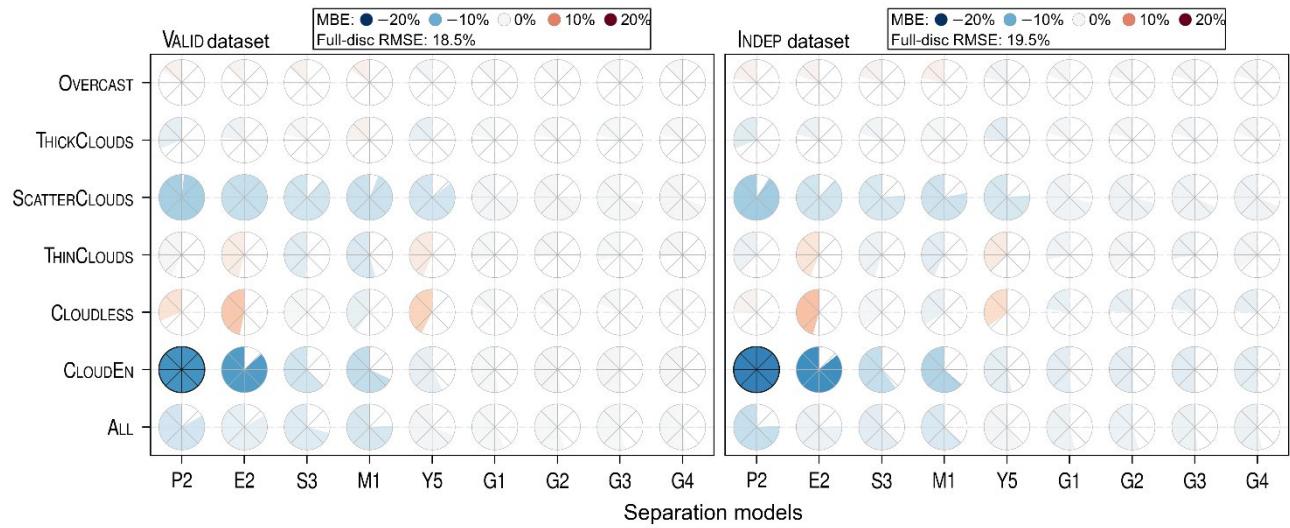


Figure S11. Same as Fig. 4 but for DIF.