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Supplement of

Bivariate spatial analysis of temperature and precipitation from general circulation models and observation proxies

R. Philbin and M. Jun

Correspondence to: M. Jun (mjun@stat.tamu.edu)

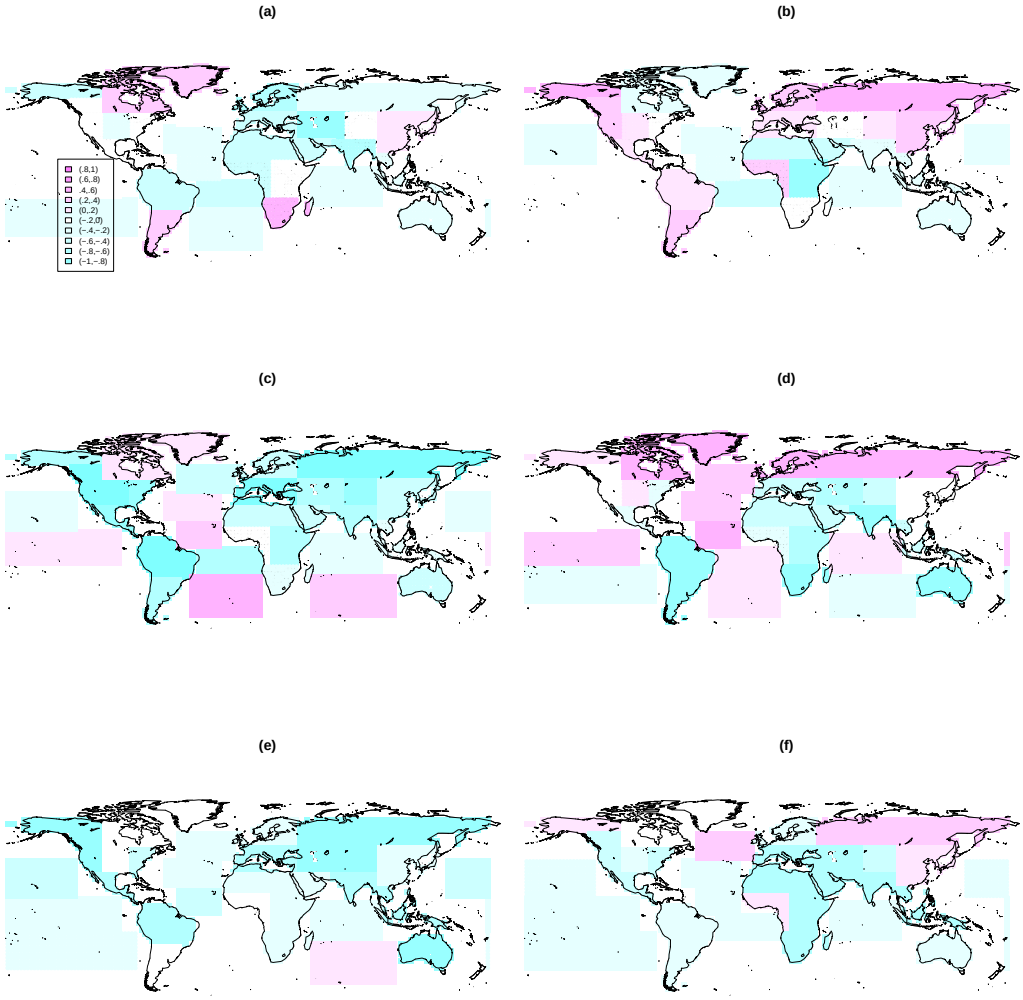

Figure 1: Correlation coefficient maps (a) JJA and (b) DJF for NCEP/GPCP, (c) JJA and (d) DJF for GFDL, and (e) JJA and (f) DJF for NCAR.

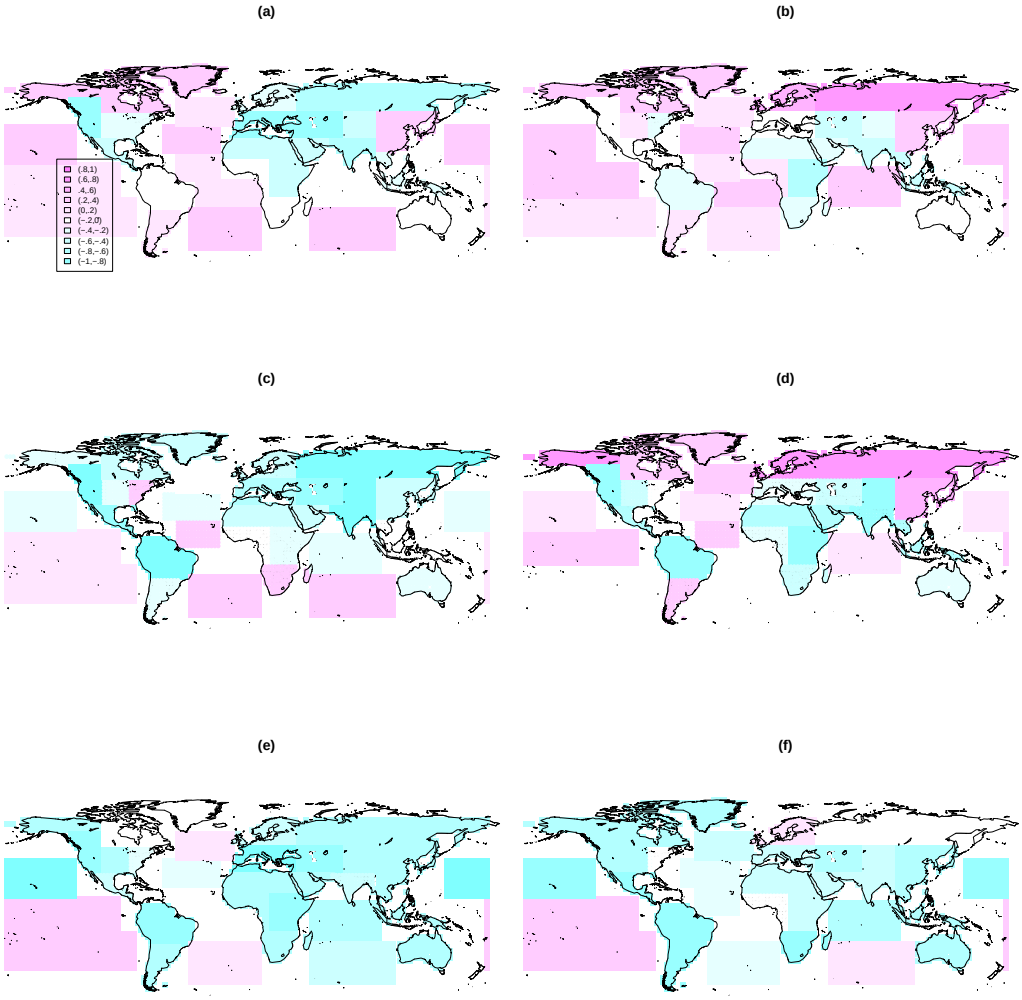

Figure 2: Correlation coefficient maps: (a) JJA and (b) DJF for GEMS, (c) JJA and (d) DJF for BCC, and (e) JJA and (f) DJF for GEOS.

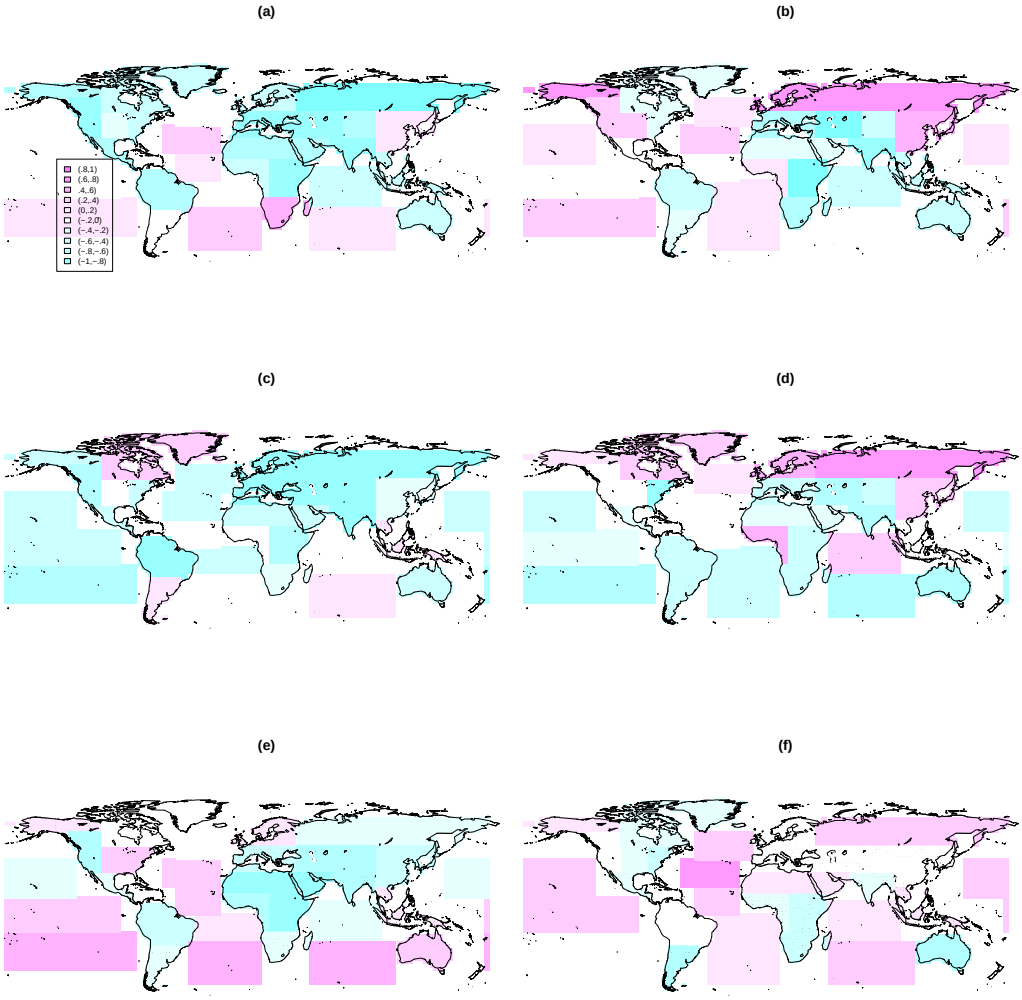

Figure 3: Correlation coefficient maps: (a) JJA and (b) DJF for MIROC, (c) JJA and (d) DJF for MPI, and (e) JJA and (f) DJF for HAD.

Table 1: Parameter estimates for Alaska (ALA) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	2.4 (0.7)	1.9 (0.4)	0.85 (0.14)	0.71 (0.14)	628 (292)	-0.362 (0.093)
BCC	1.9 (0.6)	2.4 (0.6)	0.72 (0.13)	0.82 (0.14)	883 (467)	-0.155 (0.12)
GEMS	3.2 (0.5)	2.8 (0.4)	1.4 (0.13)	1.31 (0.14)	217 (43)	0.544 (0.042)
GEOS	4.8 (1.3)	5.1 (1.7)	0.38 (0.06)	0.61 (0.05)	1580 (1090)	-0.512 (0.073)
GFDL	3.8 (1.1)	3.4 (1.1)	0.74 (0.1)	0.82 (0.13)	760 (375)	-0.563 (0.076)
HAD	2.8 (0.5)	3.3 (0.6)	0.67 (0.2)	0.86 (0.18)	445 (208)	0.293 (0.115)
MIROC	4.7 (0.8)	6.2 (1.7)	0.76 (0.07)	1.27 (0.04)	479 (128)	-0.478 (0.045)
MPI	5 (1.4)	3.2 (0.5)	1.22 (0.09)	0.7 (0.15)	479 (148)	-0.278 (0.065)
NCAR	5.4 (1.2)	3.3 (0.5)	1.2 (0.08)	0.99 (0.09)	318 (79)	-0.617 (0.029)

JJA ALA (North)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.3 (1.8)	3.5 (0.9)	0.9 (0.13)	0.82 (0.13)	751 (346)	0.628 (0.062)
BCC	6.6 (2.3)	8.3 (2.8)	1.37 (0.15)	1.48 (0.13)	633 (200)	0.949 (0.016)
GEMS	8.5 (2)	5.2 (0.9)	1.95 (0.11)	1.3 (0.12)	345 (70)	0.487 (0.046)
GEOS	5.5 (1)	18.7 (8.1)	0.47 (0.08)	1.23 (0.05)	906 (391)	-0.423 (0.079)
GFDL	7.2 (3.1)	2.5 (0.6)	1.32 (0.12)	0.83 (0.17)	749 (300)	0.29 (0.085)
HAD	4.4 (0.9)	4.9 (0.5)	1.02 (0.33)	0.24 (NA)	482 (324)	0.386 (0.092)
MIROC	3.8 (0.6)	5.4 (1)	1.29 (0.07)	1.83 (0.05)	292 (43)	0.834 (0.018)
MPI	7.3 (2.2)	2.7 (0.5)	1.72 (0.09)	1.18 (0.12)	509 (120)	0.386 (0.061)
NCAR	4.4 (0.6)	4.5 (0.7)	1.24 (0.07)	1.5 (0.07)	235 (39)	0.321 (0.041)

DJF ALA (North)

Table 2: Parameter estimates for Western North America (WNA) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.6 (2.3)	4.4 (1.6)	0.93 (0.15)	0.99 (0.16)	944 (469)	0.031 (0.105)
BCC	13.7 (5.1)	6.3 (2.4)	1.22 (0.15)	1.11 (0.18)	1124 (478)	-0.884 (0.031)
GEMS	6.3 (1.3)	2.9 (0.5)	1.67 (0.16)	1.36 (0.16)	288 (68)	-0.735 (0.029)
GEOS	14.9 (6.3)	10.1 (4.5)	0.72 (0.08)	0.7 (0.11)	2287 (1522)	-0.717 (0.047)
GFDL	10.5 (3)	6 (1.8)	1.16 (0.18)	1.09 (0.21)	625 (262)	-0.851 (0.03)
HAD	6.2 (2)	3.3 (1)	0.71 (0.15)	0.63 (0.19)	1173 (784)	-0.461 (0.095)
MIROC	18.5 (7.6)	16.3 (7)	1 (0.07)	1.05 (0.06)	1545 (713)	-0.786 (0.023)
MPI	9.7 (2.9)	2.4 (0.3)	1.57 (0.19)	0.5 (0.3)	466 (157)	-0.417 (0.06)
NCAR	16.5 (6.2)	10.5 (3.5)	1.11 (0.07)	1.02 (0.07)	913 (363)	-0.69 (0.024)

JJA WNA (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	13.7 (5.9)	5.5 (2.3)	0.57 (0.09)	0.58 (0.09)	2904 (2417)	0.416 (0.086)
BCC	30 (16.8)	8.5 (2.5)	1.98 (0.14)	0.95 (0.2)	1595 (595)	-0.69 (0.061)
GEMS	11.8 (3.3)	2.7 (0.4)	1.97 (0.16)	0.86 (0.19)	457 (115)	0.178 (0.059)
GEOS	14.7 (5.6)	18.5 (11)	0.48 (0.07)	0.78 (0.06)	4480 (3440)	-0.405 (0.079)
GFDL	8.8 (2.2)	2.5 (0.3)	2.15 (0.35)	0.74 (0.4)	329 (100)	0.148 (0.09)
HAD	13.4 (6)	5.6 (2.1)	0.66 (0.12)	0.56 (0.13)	2598 (1961)	0.109 (0.117)
MIROC	6.9 (1.2)	3.6 (0.4)	2.06 (0.11)	1 (0.15)	335 (51)	0.54 (0.041)
MPI	9.6 (2.1)	2.4 (0.2)	2.21 (0.2)	0.83 (0.26)	284 (56)	0.084 (0.075)
NCAR	11.8 (2.7)	3.7 (0.4)	1.47 (0.1)	0.89 (0.15)	330 (77)	-0.282 (0.04)

DJF WNA (Mid-N)

Table 3: Parameter estimates for Central North America (CNA) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	2.2 (0.3)	2.6 (0.6)	2.12 (0.29)	5 (49.23)	203 (17)	-0.002 (0.131)
BCC	3.4 (1.1)	1.8 (0.4)	3.21 (0.99)	1.95 (0.52)	276 (106)	-0.169 (0.147)
GEMS	3.7 (1)	2.2 (0.5)	1.37 (0.14)	1.44 (0.14)	459 (128)	-0.017 (0.076)
GEOS	4.7 (1)	1.8 (0.4)	1.16 (0.2)	0.88 (0.26)	453 (167)	-0.579 (0.068)
GFDL	10 (4.1)	3.2 (1.2)	1.55 (0.18)	1.13 (0.21)	893 (378)	-0.799 (0.043)
HAD	3.1 (0.6)	2.8 (0.8)	0.64 (0.25)	1.07 (0.23)	474 (268)	0.538 (0.099)
MIROC	3.8 (0.9)	2 (0.4)	1.58 (0.14)	1.24 (0.15)	359 (81)	-0.043 (0.07)
MPI	3.6 (0.7)	1.5 (0.3)	2.05 (0.33)	2.33 (0.33)	200 (42)	0.009 (0.094)
NCAR	4.2 (1)	2.7 (0.6)	1.31 (0.09)	1.11 (0.09)	542 (136)	0.063 (0.053)

JJA CNA (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	3.2 (0.5)	2.6 (0.8)	2.11 (0.53)	4.67 (3.79)	174 (43)	0.333 (0.133)
BCC	3.2 (1.1)	3.5 (1.4)	1.5 (0.24)	2.07 (0.24)	697 (246)	-0.171 (0.163)
GEMS	2.7 (0.5)	2 (0.5)	1.15 (0.15)	1.26 (0.15)	404 (125)	0.247 (0.071)
GEOS	3.9 (0.8)	3.8 (1.1)	0.83 (0.15)	1.44 (0.14)	535 (191)	-0.526 (0.073)
GFDL	3.7 (1.4)	1.8 (0.6)	1.16 (0.19)	1.17 (0.2)	723 (332)	0.24 (0.112)
HAD	3.2 (0.6)	2.4 (0.5)	0.83 (0.29)	0.46 (0.63)	425 (237)	-0.132 (0.133)
MIROC	4.4 (1.2)	5.2 (2)	1.2 (0.12)	1.56 (0.1)	501 (162)	0.577 (0.049)
MPI	3.2 (0.6)	2.8 (0.7)	1.59 (0.22)	2.5 (0.22)	299 (63)	0.098 (0.103)
NCAR	3.1 (0.7)	2.3 (0.5)	1.16 (0.1)	1.24 (0.09)	438 (117)	-0.048 (0.053)

DJF CNA (Mid-N)

Table 4: Parameter estimates for Eastern North America (ENA) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	1.8 (0.5)	1.1 (0.4)	1.39 (0.72)	2.31 (0.75)	277 (161)	0.193 (0.175)
BCC	3.4 (1.6)	3.2 (1.4)	1.26 (0.29)	1 (0.35)	995 (709)	0.559 (0.123)
GEMS	4.2 (1.8)	1 (0.3)	0.91 (0.16)	0.7 (0.15)	838 (510)	-0.173 (0.1)
GEOS	6.7 (2.3)	1 (0.2)	1.21 (0.25)	0.42 (0.41)	596 (319)	-0.135 (0.127)
GFDL	4.3 (1.5)	1.9 (0.5)	1.7 (0.49)	1.17 (0.51)	349 (190)	-0.785 (0.068)
HAD	1.6 (7.6)	1.2 (7.6)	4.71 (NA)	5 (0)	3 (0)	0.43 (2.78)
MIROC	3.6 (0.8)	1.1 (0.2)	1.83 (0.36)	1.02 (0.36)	176 (58)	-0.29 (0.087)
MPI	1.5 (0.4)	1 (0.2)	1.05 (0.36)	0.93 (0.33)	294 (149)	-0.296 (0.112)
NCAR	1.7 (0.4)	1 (0.2)	0.97 (0.14)	0.59 (0.17)	336 (134)	-0.267 (0.066)

JJA ENA (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	3.6 (1.2)	1.5 (0.4)	1.13 (0.29)	0.5 (0.67)	501 (296)	0.196 (0.155)
BCC	5.5 (3.3)	1.6 (0.2)	1.84 (0.46)	0.1 (NA)	838 (520)	0.119 (0.241)
GEMS	2.7 (0.7)	1.2 (0.2)	2.47 (0.57)	0.95 (0.49)	194 (70)	-0.134 (0.104)
GEOS	3.6 (1.5)	3.3 (1.6)	0.81 (0.17)	0.81 (0.29)	900 (630)	0.069 (0.14)
GFDL	3.7 (1.7)	1.4 (0.4)	1.31 (0.39)	0.37 (0.81)	624 (485)	-0.171 (0.159)
HAD	2.4 (0.4)	2.4 (0.3)	0.75 (0.63)	0.1 (33.57)	242 (206)	-0.305 (0.175)
MIROC	3.2 (0.9)	2.7 (0.8)	1.09 (0.2)	0.9 (0.18)	429 (203)	-0.178 (0.093)
MPI	4 (1.1)	1.1 (0.4)	1.13 (0.29)	0.67 (0.44)	457 (251)	-0.699 (0.075)
NCAR	3.4 (1.3)	8.5 (4.5)	0.75 (0.09)	0.95 (0.1)	1399 (810)	-0.348 (0.07)

DJF ENA (Mid-N)

Table 5: Parameter estimates for Greenland (GRL) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	3.9 (1.5)	2.4 (0.6)	0.55 (0.05)	0.34 (0.09)	2318 (1760)	0.402 (0.061)
BCC	1.9 (0.3)	3.5 (0.5)	1.18 (0.1)	0.7 (0.16)	376 (89)	-0.323 (0.072)
GEMS	4.4 (1.2)	5 (1.1)	0.67 (0.04)	0.52 (0.04)	1187 (536)	0.566 (0.03)
GEOS	4 (0.3)	4.6 (0.7)	0.17 (0.04)	0.43 (0.01)	663 (293)	0.045 (0.061)
GFDL	3.9 (0.6)	2.9 (0.2)	1.86 (0.13)	0.63 (0.2)	209 (34)	0.282 (0.064)
HAD	3.2 (0.4)	2.2 (0.2)	0.7 (0.14)	0.44 (0.18)	353 (130)	0.135 (0.083)
MIROC	3.7 (0.7)	4.1 (0.5)	1.29 (0.04)	0.68 (0.06)	550 (102)	-0.203 (0.039)
MPI	3.9 (0.6)	4.5 (0.5)	1.05 (0.04)	0.62 (0.08)	419 (80)	0.511 (0.042)
NCAR	4.4 (0.5)	2 (0.1)	1.48 (0.04)	0.72 (0.06)	188 (19)	0.079 (0.03)

JJA GRL (North)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	7.9 (1.8)	28.1 (12.8)	0.82 (0.06)	1.59 (0.04)	1096 (356)	-0.114 (0.079)
BCC	3.4 (1)	3.5 (0.6)	1.57 (0.06)	0.78 (0.12)	766 (180)	0.493 (0.062)
GEMS	10.6 (3.9)	8.9 (2.1)	0.98 (0.03)	0.65 (0.05)	1494 (586)	0.527 (0.031)
GEOS	8 (1.6)	52.8 (25.8)	0.5 (0.05)	1.19 (0.03)	1663 (766)	-0.479 (0.055)
GFDL	7.1 (1.5)	5 (0.7)	1.57 (0.07)	1.12 (0.09)	434 (82)	0.61 (0.043)
HAD	9.1 (3.6)	9.5 (2.1)	0.84 (0.09)	0.39 (0.21)	1439 (864)	-0.182 (0.09)
MIROC	12.9 (4)	30.8 (11)	1.17 (0.03)	1.33 (0.02)	1709 (468)	-0.125 (0.043)
MPI	11.3 (3.4)	8.7 (1.7)	1.21 (0.04)	0.9 (0.05)	894 (242)	0.597 (0.035)
NCAR	10.1 (1.7)	7.8 (0.9)	1.61 (0.04)	1.36 (0.04)	298 (36)	0.036 (0.032)

DJF GRL (North)

Table 6: Parameter estimates for Northern Europe (NEU) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	3.3 (1.6)	1.9 (0.7)	0.44 (0.11)	0.43 (0.08)	3619 (3723)	-0.484 (0.078)
BCC	3.5 (1.8)	2.6 (0.7)	0.98 (0.14)	0.61 (0.22)	1379 (912)	-0.355 (0.113)
GEMS	3.7 (0.9)	1.3 (0.2)	1.08 (0.14)	0.88 (0.14)	417 (136)	-0.182 (0.06)
GEOS	4.7 (1.3)	3.6 (1.2)	0.67 (0.09)	0.9 (0.1)	901 (440)	-0.38 (0.075)
GFDL	3 (0.8)	1.5 (0.3)	0.5 (0.1)	0.58 (0.12)	831 (548)	-0.435 (0.078)
HAD	2.3 (0.4)	2.1 (0.3)	0.76 (0.31)	0.5 (0.46)	359 (217)	0.371 (0.11)
MIROC	5.9 (2.2)	3.5 (1.2)	0.62 (0.07)	0.72 (0.06)	1475 (919)	-0.319 (0.052)
MPI	11.2 (7.4)	1.8 (0.5)	0.8 (0.09)	0.38 (0.13)	2523 (2209)	-0.668 (0.042)
NCAR	8.4 (4.7)	3.3 (1.3)	0.66 (0.06)	0.53 (0.07)	3038 (2560)	-0.194 (0.042)

JJA NEU (North)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	8.2 (1.7)	9 (2.6)	1.26 (0.19)	2.55 (0.15)	409 (85)	0.442 (0.087)
BCC	4.6 (1.3)	7.9 (2.4)	1.57 (0.22)	1.63 (0.23)	556 (185)	0.917 (0.026)
GEMS	25.7 (13.9)	7.3 (2.5)	1.3 (0.1)	0.87 (0.09)	1345 (618)	0.61 (0.04)
GEOS	4.8 (1.2)	11.1 (5.4)	0.21 (0.06)	0.5 (0.02)	5258 (5240)	0.284 (0.087)
GFDL	3.2 (0.6)	4.6 (1.1)	0.86 (0.15)	1.44 (0.14)	436 (142)	0.687 (0.05)
HAD	2.8 (1)	5.5 (2)	0.29 (0.09)	0.32 (0.07)	4252 (4622)	0.147 (0.126)
MIROC	8 (1.7)	9 (1.8)	1.51 (0.09)	1.75 (0.07)	413 (74)	0.811 (0.02)
MPI	5.6 (1.4)	5.5 (1.2)	1.08 (0.12)	1.35 (0.1)	474 (137)	0.676 (0.047)
NCAR	11.1 (3.6)	20.2 (8.6)	1.02 (0.06)	1.38 (0.05)	955 (337)	-0.133 (0.045)

DJF NEU (North)

Table 7: Parameter estimates for Northern Asia (NAS) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	8.2 (4.2)	3.2 (1)	0.78 (0.05)	0.48 (0.07)	4298 (2925)	-0.161 (0.05)
BCC	7 (2.2)	11.1 (4.2)	0.78 (0.06)	0.92 (0.06)	2120 (1021)	-0.84 (0.019)
GEMS	6.5 (1.5)	5.7 (1)	1.2 (0.05)	0.91 (0.07)	727 (169)	-0.55 (0.023)
GEOS	14.4 (5.6)	13.7 (6.6)	0.61 (0.03)	0.75 (0.04)	6272 (4093)	-0.601 (0.03)
GFDL	17.3 (7.6)	13.5 (6.2)	0.78 (0.05)	0.84 (0.04)	4819 (2711)	-0.791 (0.019)
HAD	4.5 (1.3)	5.9 (2)	0.45 (0.06)	0.59 (0.05)	3284 (2187)	-0.115 (0.059)
MIROC	13.7 (4.7)	14.7 (5.5)	0.84 (0.03)	0.94 (0.03)	2367 (996)	-0.822 (0.01)
MPI	14.7 (5.3)	5.3 (1.2)	1.2 (0.05)	0.84 (0.07)	1065 (360)	-0.795 (0.015)
NCAR	11.9 (5.1)	11.2 (4.4)	0.73 (0.02)	0.7 (0.03)	4122 (2452)	-0.727 (0.011)

JJA NAS (North)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.6 (1.4)	5.2 (0.8)	0.7 (0.06)	0.66 (0.06)	1015 (363)	0.791 (0.02)
BCC	12.6 (2.8)	16.6 (3.6)	1.63 (0.08)	1.56 (0.09)	637 (116)	0.988 (0.002)
GEMS	4.4 (0.4)	7.6 (0.8)	1.44 (0.05)	1.22 (0.05)	380 (41)	0.828 (0.011)
GEOS	4.3 (0.7)	15.4 (6.9)	0.27 (0.04)	0.86 (0.01)	2418 (1423)	0.17 (0.042)
GFDL	4.7 (0.7)	4.7 (0.5)	0.98 (0.07)	0.81 (0.08)	510 (110)	0.796 (0.018)
HAD	3.6 (0.5)	4.9 (0.8)	0.37 (0.07)	0.43 (0.07)	1313 (768)	0.448 (0.048)
MIROC	14.7 (2)	18.4 (2.5)	1.71 (0.03)	1.7 (0.03)	436 (42)	0.977 (0.002)
MPI	6.5 (0.6)	6.4 (0.5)	1.76 (0.06)	1.39 (0.08)	249 (22)	0.865 (0.011)
NCAR	4.6 (0.4)	3.8 (0.2)	1.32 (0.04)	0.92 (0.05)	251 (22)	0.534 (0.016)

DJF NAS (North)

Table 8: Parameter estimates for the Mediterranean (MED) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	3 (0.6)	2.5 (0.6)	0.83 (0.25)	1.1 (0.2)	515 (256)	-0.259 (0.096)
BCC	3.1 (0.6)	3 (0.7)	1.45 (0.28)	1.46 (0.32)	466 (155)	-0.518 (0.087)
GEMS	3.8 (0.3)	2 (0.2)	0.96 (0.17)	1.11 (0.16)	238 (56)	-0.668 (0.035)
GEOS	5.3 (0.6)	3.6 (0.4)	1.2 (0.28)	1.35 (0.29)	247 (70)	-0.825 (0.027)
GFDL	5.5 (0.9)	2.8 (0.4)	1.29 (0.27)	1.09 (0.31)	389 (134)	-0.828 (0.031)
HAD	3.7 (0.4)	3 (0.5)	0.81 (0.41)	1.26 (0.41)	303 (151)	-0.276 (0.111)
MIROC	7.1 (0.9)	5.1 (0.6)	1.46 (0.14)	1.58 (0.14)	250 (41)	-0.79 (0.025)
MPI	3.7 (0.4)	2.5 (0.2)	1.33 (0.27)	1.38 (0.26)	214 (52)	-0.638 (0.044)
NCAR	2.9 (0.3)	2.8 (0.2)	1.02 (0.13)	1.05 (0.13)	213 (43)	-0.498 (0.034)

JJA MED (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	5.4 (1.1)	2.9 (0.5)	0.84 (0.21)	0.88 (0.21)	549 (244)	0.303 (0.094)
BCC	5.5 (2)	4.2 (1.4)	1.04 (0.18)	0.89 (0.2)	999 (523)	-0.127 (0.12)
GEMS	7.2 (1.2)	2.3 (0.2)	1.27 (0.18)	0.77 (0.19)	357 (92)	0.035 (0.063)
GEOS	6.1 (1.2)	5.6 (1.4)	0.53 (0.11)	0.83 (0.11)	839 (416)	-0.216 (0.086)
GFDL	6.6 (1.3)	2.5 (0.4)	1.8 (0.38)	1.22 (0.41)	306 (92)	-0.255 (0.097)
HAD	5 (0.9)	3.8 (0.6)	0.64 (0.26)	0.5 (0.37)	555 (355)	0.102 (0.119)
MIROC	10.5 (1.8)	5.2 (0.8)	1.52 (0.14)	1.5 (0.12)	364 (62)	-0.507 (0.054)
MPI	7.3 (1.2)	2.8 (0.4)	1.15 (0.22)	0.91 (0.21)	334 (97)	-0.239 (0.084)
NCAR	6.5 (0.7)	4.1 (0.4)	1.28 (0.11)	1.24 (0.11)	246 (38)	-0.564 (0.033)

DJF MED (Mid-N)

Table 9: Parameter estimates for the Caspian (CAS) by season with asymptotic standard errors in parentheses

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	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	7.1 (1)	2.8 (0.2)	2.55 (0.78)	0.79 (0.72)	190 (62)	-0.604 (0.056)
BCC	3.5 (0.5)	3.5 (0.5)	5 (0.04)	3.96 (0)	112 (8)	-0.697 (0.062)
GEMS	7.1 (0.8)	2.9 (0.3)	1.67 (0.17)	0.81 (0.21)	199 (32)	-0.723 (0.028)
GEOS	7.6 (0.8)	3.5 (0.4)	2.18 (0.65)	1.44 (0.6)	155 (45)	-0.699 (0.042)
GFDL	7.4 (1.2)	3.2 (0.3)	1.66 (0.37)	0.51 (0.57)	267 (85)	-0.413 (0.072)
HAD	4.9 (1)	2.8 (0.3)	0.92 (0.33)	0.37 (0.5)	407 (213)	-0.601 (0.071)
MIROC	6.1 (0.6)	3.9 (0.3)	2.62 (0.26)	1.39 (0.23)	131 (17)	-0.77 (0.023)
MPI	9.5 (1.8)	3 (0.3)	1.24 (0.21)	0.38 (0.31)	356 (125)	-0.677 (0.037)
NCAR	8.2 (1.2)	4.1 (0.5)	1.27 (0.08)	0.61 (0.11)	379 (72)	-0.652 (0.026)

JJA CAS (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	4 (0.6)	2.1 (0.2)	3.34 (1.85)	1.69 (1.16)	119 (54)	0.071 (0.101)
BCC	2.5 (0.4)	3.2 (0.4)	5 (0.13)	4.31 (0)	102 (9)	-0.279 (0.11)
GEMS	6.5 (1)	2.8 (0.2)	1.83 (0.21)	0.9 (0.26)	214 (38)	-0.258 (0.061)
GEOS	5 (0.6)	3.7 (0.5)	1.33 (0.54)	1.14 (0.48)	224 (93)	-0.462 (0.068)
GFDL	4.8 (0.7)	2.9 (0.3)	2.91 (1.09)	1.43 (0.9)	125 (43)	-0.436 (0.081)
HAD	4.5 (0.5)	2.3 (0.2)	2.53 (NA)	1.41 (1.08)	143 (73)	0.062 (0.111)
MIROC	9.2 (1.1)	8.3 (1)	2.5 (0.2)	2.1 (0.19)	168 (20)	-0.9 (0.013)
MPI	6.6 (1.1)	3 (0.3)	1.4 (0.2)	0.71 (0.28)	258 (64)	-0.551 (0.057)
NCAR	6 (0.7)	3.6 (0.3)	1.5 (0.12)	0.91 (0.15)	191 (29)	-0.548 (0.032)

DJF CAS (Mid-N)

Table 10: Parameter estimates for Tibet (TIB) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	10.3 (4.2)	3.3 (0.5)	1.45 (0.28)	0.34 (0.62)	590 (333)	0.043 (0.106)
BCC	11.9 (3.9)	5.4 (1.3)	3.04 (0.79)	2 (0.6)	238 (88)	-0.914 (0.025)
GEMS	4.8 (0.5)	2.5 (0.2)	2.57 (0.47)	0.72 (0.47)	119 (24)	-0.392 (0.051)
GEOS	8.5 (1.2)	3.9 (0.3)	1.6 (0.6)	0.65 (0.77)	168 (68)	-0.559 (0.061)
GFDL	21.4 (11.1)	5.8 (1.5)	1.33 (0.25)	0.52 (0.33)	722 (525)	-0.789 (0.039)
HAD	5.6 (0.9)	2.4 (0.2)	0.93 (0.4)	0.14 (NA)	278 (139)	-0.468 (0.092)
MIROC	7.4 (0.8)	4.5 (0.4)	3.15 (0.47)	1.74 (0.34)	101 (17)	-0.432 (0.052)
MPI	7.7 (0.8)	4 (0.4)	4.22 (1.35)	2.27 (0.46)	79 (20)	-0.791 (0.03)
NCAR	7.4 (0.9)	3.5 (0.3)	1.58 (0.13)	0.67 (0.18)	180 (30)	-0.674 (0.025)

JJA TIB (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	5.2 (1)	3.2 (0.4)	1.44 (0.39)	0.47 (0.62)	327 (129)	0.351 (0.093)
BCC	5.1 (1.3)	5 (1.2)	2.01 (0.45)	1.39 (0.46)	376 (131)	-0.762 (0.06)
GEMS	3.7 (0.5)	3.5 (0.4)	1.33 (0.18)	0.58 (0.25)	267 (65)	-0.049 (0.064)
GEOS	6 (0.8)	3.5 (0.3)	1.47 (0.61)	0.54 (0.79)	173 (72)	-0.32 (0.079)
GFDL	5.1 (0.6)	3.6 (0.4)	5 (0.05)	2.74 (0)	81 (5)	-0.239 (0.093)
HAD	5.2 (0.6)	2.7 (0.3)	1.2 (0.92)	0.55 (1.23)	187 (113)	0.002 (0.129)
MIROC	5 (0.6)	4.5 (0.4)	4.07 (0.34)	1.74 (0.15)	113 (12)	-0.326 (0.054)
MPI	7.1 (0.8)	3.4 (0.3)	5 (0.07)	1.79 (0)	90 (4)	-0.34 (0.067)
NCAR	5.6 (0.6)	3.8 (0.3)	1.67 (0.17)	0.86 (0.2)	151 (25)	-0.349 (0.042)

DJF TIB (Mid-N)

Table 11: Parameter estimates for Eastern Asia (EAS) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.7 (1.6)	2.5 (0.5)	1.3 (0.25)	1.17 (0.24)	474 (163)	0.323 (0.096)
BCC	6.3 (1.4)	1.9 (0.2)	3.2 (0.41)	0.75 (0.43)	332 (69)	-0.157 (0.096)
GEMS	10.6 (2.2)	4 (0.6)	1.55 (0.11)	1.16 (0.12)	474 (97)	0.564 (0.039)
GEOS	7.3 (1)	2.6 (0.3)	0.93 (0.17)	0.86 (0.15)	419 (123)	-0.467 (0.058)
GFDL	5.1 (0.8)	2.2 (0.3)	1.51 (0.21)	0.91 (0.25)	370 (90)	-0.314 (0.07)
HAD	5.6 (1)	4.3 (0.9)	0.88 (0.2)	1.04 (0.23)	522 (200)	-0.207 (0.098)
MIROC	15.7 (3.4)	2.9 (0.3)	2.05 (0.11)	1.27 (0.12)	333 (50)	0.308 (0.045)
MPI	6 (0.9)	2.2 (0.2)	2.02 (0.25)	1.03 (0.26)	225 (41)	-0.199 (0.066)
NCAR	5.4 (0.7)	2.2 (0.2)	1.18 (0.07)	0.81 (0.1)	319 (54)	-0.002 (0.038)

JJA EAS (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.1 (0.9)	3.4 (0.6)	1.53 (0.31)	1.72 (0.31)	338 (94)	0.509 (0.076)
BCC	6.4 (1.1)	6.3 (1)	3.52 (0.78)	2.52 (0.49)	273 (73)	0.665 (0.063)
GEMS	6.1 (0.9)	3.7 (0.5)	1.43 (0.12)	1.11 (0.13)	393 (77)	0.543 (0.039)
GEOS	8.1 (2)	6.7 (1.8)	0.7 (0.09)	0.71 (0.08)	1341 (618)	-0.408 (0.063)
GFDL	5.8 (1.1)	3.3 (0.6)	1.35 (0.2)	1.04 (0.2)	532 (164)	0.144 (0.078)
HAD	7.7 (2.5)	6.3 (2.3)	0.67 (0.12)	0.49 (0.21)	1650 (1121)	0.074 (0.108)
MIROC	8 (0.9)	4.8 (0.6)	2.22 (0.14)	2.11 (0.13)	214 (24)	0.786 (0.021)
MPI	6.7 (1)	4 (0.5)	1.77 (0.22)	1.59 (0.2)	306 (61)	0.544 (0.052)
NCAR	6.9 (1.2)	3.6 (0.4)	1.24 (0.07)	0.86 (0.09)	471 (91)	0.247 (0.036)

DJF EAS (Mid-N)

Table 12: Parameter estimates for Southeast Asia (SEA) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	4.5 (0.6)	1.2 (0.2)	3.6 (1.37)	5 (52.56)	97 (15)	-0.186 (0.132)
BCC	6.9 (1.4)	1.2 (0.2)	5 (NA)	2.11 (0)	170 (23)	0.19 (0.164)
GEMS	6.1 (0.8)	1.2 (0.1)	1.06 (0.27)	0.72 (0.31)	236 (79)	-0.011 (0.084)
GEOS	9.8 (2)	1.1 (0.1)	0.85 (0.25)	0.14 (1.75)	511 (287)	-0.458 (0.092)
GFDL	6.1 (1.4)	1.1 (0.1)	1.99 (0.57)	0.55 (0.73)	351 (143)	-0.161 (0.13)
HAD	5.7 (0.9)	1.2 (0.1)	2.77 (NA)	0.18 (36.12)	168 (103)	0.331 (0.144)
MIROC	5.9 (0.6)	1.5 (0.2)	1.66 (0.78)	1.59 (0.79)	131 (55)	-0.38 (0.071)
MPI	6.5 (0.8)	1 (0.1)	0.68 (0.4)	0.5 (0.42)	275 (164)	0.264 (0.101)
NCAR	5 (0.6)	1.3 (0.1)	1.02 (0.14)	0.38 (0.25)	290 (79)	-0.434 (0.049)

JJA SEA (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.6 (1.3)	1.7 (0.4)	1.34 (0.36)	1.15 (0.4)	512 (212)	-0.051 (0.143)
BCC	11.1 (3.2)	2.4 (0.6)	1.12 (0.4)	0.86 (0.38)	721 (388)	-0.545 (0.13)
GEMS	7.4 (1.8)	1.9 (0.3)	0.52 (0.08)	0.37 (0.11)	1229 (697)	-0.225 (0.078)
GEOS	12.4 (3.4)	2 (0.4)	0.73 (0.17)	0.33 (0.27)	1009 (615)	-0.533 (0.089)
GFDL	11.7 (2.7)	1.9 (0.4)	1.6 (0.37)	0.79 (0.37)	606 (219)	-0.262 (0.124)
HAD	6.1 (1.2)	2.3 (0.3)	2.09 (0.35)	1.88 (NA)	421 (204)	0.255 (0.154)
MIROC	10.7 (2)	1.7 (0.2)	1.49 (0.34)	0.76 (0.32)	318 (101)	-0.37 (0.076)
MPI	9.6 (2)	1.4 (0.2)	0.42 (0.13)	0.26 (0.14)	1373 (838)	0.146 (0.101)
NCAR	12.8 (2.8)	2.7 (0.4)	1.12 (0.1)	0.57 (0.15)	683 (199)	-0.545 (0.047)

DJF SEA (Equat)

Table 13: Parameter estimates for the Sahara (SAH) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	12.9 (5.1)	9.7 (4.2)	1.4 (0.15)	1.64 (0.14)	1077 (444)	-0.245 (0.072)
BCC	4.4 (0.8)	3.1 (0.5)	2.88 (0.43)	2.12 (0.36)	309 (63)	-0.336 (0.073)
GEMS	10.9 (4)	11.3 (5.1)	1 (0.07)	1.13 (0.06)	1528 (705)	-0.272 (0.042)
GEOS	11.7 (4)	5.1 (1.5)	1.4 (0.15)	1.02 (0.16)	889 (356)	-0.499 (0.05)
GFDL	9.8 (1.9)	2.8 (0.4)	1.77 (0.2)	1.04 (0.21)	488 (118)	-0.247 (0.062)
HAD	7.6 (1.5)	5.2 (1.2)	0.97 (0.2)	0.97 (0.17)	851 (353)	-0.647 (0.05)
MIROC	7.8 (1.3)	11.9 (2.9)	1.64 (0.11)	2.29 (0.1)	444 (78)	-0.437 (0.038)
MPI	8.4 (2)	7.8 (2.5)	1.17 (0.16)	1.54 (0.13)	600 (217)	-0.375 (0.05)
NCAR	9.7 (3)	4.7 (1.1)	1.16 (0.06)	0.86 (0.07)	864 (288)	-0.163 (0.033)

JJA SAH (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	5 (1.1)	2 (0.4)	1.02 (0.13)	0.76 (0.14)	933 (293)	-0.235 (0.078)
BCC	3 (0.6)	2.5 (0.5)	1.15 (0.19)	0.92 (0.19)	659 (214)	-0.483 (0.065)
GEMS	5.9 (0.9)	2.7 (0.3)	1.47 (0.12)	1.06 (0.11)	430 (81)	-0.144 (0.045)
GEOS	4.1 (0.8)	4.8 (1)	1.2 (0.14)	1.29 (0.17)	569 (162)	-0.207 (0.067)
GFDL	4.1 (0.9)	2.9 (0.5)	0.99 (0.16)	0.73 (0.15)	697 (237)	-0.345 (0.064)
HAD	3 (0.3)	2 (0.2)	0.91 (0.33)	0.55 (0.51)	406 (174)	0.269 (0.084)
MIROC	5.3 (0.8)	1.9 (0.2)	2.27 (0.13)	0.96 (0.14)	367 (49)	-0.171 (0.043)
MPI	3.3 (0.4)	2.7 (0.4)	0.67 (0.1)	0.7 (0.1)	708 (211)	-0.117 (0.058)
NCAR	5.5 (1)	3.6 (0.5)	1.27 (0.06)	0.83 (0.07)	590 (110)	-0.581 (0.022)

DJF SAH (Equat)

Table 14: Parameter estimates for West Africa (WAF) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	13.3 (4.1)	3.1 (1)	2.12 (0.38)	2.11 (0.35)	510 (183)	-0.249 (0.118)
BCC	30.3 (19.3)	4.1 (2.2)	1.5 (0.22)	1.04 (0.29)	1508 (803)	0.122 (0.215)
GEMS	14.3 (3.8)	2 (0.4)	1.73 (0.16)	1.03 (0.14)	574 (154)	0.147 (0.068)
GEOS	13.1 (3.7)	2.5 (0.7)	0.78 (0.12)	0.7 (0.13)	1039 (560)	-0.538 (0.07)
GFDL	11 (4.6)	1.6 (0.4)	0.96 (0.15)	0.46 (0.25)	1239 (775)	0.054 (0.114)
HAD	11 (4.4)	3.4 (1.9)	0.71 (0.12)	0.94 (0.12)	2057 (1503)	-0.553 (0.09)
MIROC	24.4 (8.1)	3.9 (1.2)	1.54 (0.13)	1.22 (0.12)	764 (268)	-0.385 (0.054)
MPI	18.5 (6.2)	4.3 (1.5)	1.42 (0.2)	1.29 (0.2)	751 (322)	0.085 (0.093)
NCAR	18.7 (6.6)	4 (1.3)	1.12 (0.07)	0.87 (0.08)	1310 (507)	0.199 (0.048)

JJA WAF (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.3 (1.7)	2.2 (0.7)	1.54 (0.51)	2.03 (0.43)	369 (164)	0.4 (0.12)
BCC	7.8 (2.4)	1.7 (0.4)	1.62 (0.34)	0.94 (0.36)	522 (201)	-0.147 (0.15)
GEMS	8.5 (2)	1.3 (0.2)	1.68 (0.17)	0.63 (0.21)	416 (106)	0.212 (0.065)
GEOS	6.1 (1.4)	2.6 (0.6)	0.7 (0.15)	0.79 (0.14)	657 (308)	0.042 (0.102)
GFDL	6.5 (1.6)	1.2 (0.2)	1.36 (0.28)	0.47 (0.42)	438 (172)	-0.167 (0.103)
HAD	3.9 (0.6)	1.2 (0.2)	0.81 (0.32)	0.63 (0.52)	420 (230)	-0.094 (0.131)
MIROC	6.9 (1.2)	1.8 (0.3)	1.34 (0.15)	1.06 (0.16)	336 (81)	0.303 (0.058)
MPI	7.2 (1.2)	1.6 (0.2)	2.1 (0.48)	1.32 (0.41)	215 (61)	0.613 (0.059)
NCAR	9.7 (2.4)	2.3 (0.4)	1.25 (0.08)	0.78 (0.1)	512 (138)	0.275 (0.045)

DJF WAF (Equat)

Table 15: Parameter estimates for East Africa (EAF) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	11.9 (3.3)	2.1 (0.4)	1.35 (0.24)	0.85 (0.27)	590 (232)	0.014 (0.104)
BCC	10.1 (2.8)	1.7 (0.2)	3.18 (0.67)	0.97 (0.48)	329 (100)	-0.127 (0.117)
GEMS	9 (1.7)	1.7 (0.2)	1.61 (0.14)	0.56 (0.22)	414 (91)	-0.237 (0.054)
GEOS	12.6 (1.9)	2 (0.2)	1.62 (0.3)	0.8 (0.37)	316 (89)	-0.609 (0.051)
GFDL	8.8 (1.4)	2.5 (0.3)	1.82 (0.38)	1.09 (0.39)	286 (81)	-0.428 (0.074)
HAD	9.4 (1.7)	1.9 (0.2)	0.92 (0.27)	0.3 (0.59)	546 (259)	-0.666 (0.061)
MIROC	10.3 (1.1)	2.6 (0.3)	2.11 (0.21)	1.56 (0.19)	193 (28)	-0.752 (0.025)
MPI	10.2 (1.8)	1.9 (0.3)	0.77 (0.13)	0.41 (0.16)	717 (293)	-0.451 (0.059)
NCAR	6.1 (0.5)	1.9 (0.1)	1.93 (0.18)	1.03 (0.19)	169 (24)	-0.095 (0.041)

JJA EAF (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	4.9 (0.9)	1.5 (0.2)	1.59 (0.39)	0.83 (0.39)	354 (127)	-0.608 (0.06)
BCC	6.6 (1.4)	2.2 (0.4)	2.41 (0.44)	1.47 (0.4)	337 (88)	-0.706 (0.061)
GEMS	5.4 (1)	2.4 (0.4)	1.11 (0.11)	0.72 (0.13)	517 (139)	-0.433 (0.05)
GEOS	7.5 (1.2)	2.5 (0.3)	1.97 (0.45)	1.41 (0.43)	248 (73)	-0.392 (0.071)
GFDL	4.8 (0.7)	2 (0.2)	1.88 (0.42)	1.02 (0.44)	242 (67)	-0.587 (0.057)
HAD	5.5 (1.2)	1.9 (0.3)	0.86 (0.19)	0.41 (0.41)	712 (327)	-0.215 (0.116)
MIROC	6.6 (0.6)	2.4 (0.2)	2.13 (0.26)	2.1 (0.26)	130 (17)	-0.808 (0.021)
MPI	6.1 (1)	2.2 (0.4)	0.58 (0.1)	0.55 (0.1)	708 (288)	-0.28 (0.071)
NCAR	5.7 (0.6)	2.4 (0.2)	1.73 (0.1)	1.01 (0.12)	249 (32)	-0.446 (0.033)

DJF EAF (Equat)

Table 16: Parameter estimates for South Africa (SAF) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	11.9 (4.8)	2 (0.5)	1.51 (0.4)	1.14 (0.37)	480 (201)	0.64 (0.103)
BCC	7 (1.7)	2.7 (0.6)	2.23 (0.57)	1.71 (0.49)	356 (124)	0.473 (0.102)
GEMS	5.9 (1.6)	2.1 (0.4)	1.14 (0.13)	0.58 (0.19)	648 (236)	0.191 (0.066)
GEOS	9.8 (1.8)	2.1 (0.3)	1.87 (0.56)	1.29 (0.52)	235 (87)	-0.491 (0.075)
GFDL	8.8 (2.1)	1.8 (0.3)	1.7 (0.45)	1.19 (0.43)	308 (113)	-0.107 (0.131)
HAD	3.6 (0.5)	2.2 (0.4)	0.7 (0.38)	0.97 (0.38)	318 (164)	-0.064 (0.133)
MIROC	13.4 (2.9)	2.5 (0.4)	1.92 (0.15)	1.11 (0.19)	357 (73)	0.721 (0.033)
MPI	5.5 (1.1)	1.4 (0.1)	3.02 (0.96)	0.94 (0.68)	154 (51)	-0.002 (0.086)
NCAR	8.4 (1.6)	2.2 (0.3)	1.37 (0.12)	0.76 (0.15)	362 (91)	-0.036 (0.05)

JJA SAF (Mid-S)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.7 (1.2)	3.1 (0.8)	2.07 (0.42)	2.9 (0.46)	317 (78)	0.114 (0.125)
BCC	8.9 (1.6)	2.8 (0.6)	4.81 (0.5)	2.93 (0.11)	216 (30)	-0.389 (0.112)
GEMS	12.4 (4.4)	3.8 (1.2)	1.28 (0.13)	0.98 (0.14)	802 (335)	-0.134 (0.068)
GEOS	14.2 (3.8)	6.4 (2)	1.27 (0.21)	1.28 (0.18)	655 (258)	-0.61 (0.063)
GFDL	17.8 (6.1)	3.6 (1)	1.89 (0.26)	1.07 (0.27)	661 (240)	-0.629 (0.074)
HAD	6.5 (1.2)	3.4 (1.1)	3.3 (1.83)	3.75 (NA)	160 (89)	-0.398 (0.134)
MIROC	14.1 (3.2)	8.4 (2.5)	1.65 (0.16)	1.86 (0.13)	502 (129)	-0.47 (0.051)
MPI	10.4 (2.9)	4.9 (2)	1.05 (0.2)	1.15 (0.17)	646 (295)	-0.4 (0.074)
NCAR	12.4 (3.3)	4.2 (1)	1.45 (0.12)	1.03 (0.11)	522 (157)	-0.425 (0.043)

DJF SAF (Mid-S)

Table 17: Parameter estimates for Central America (CAM) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.7 (1.6)	1.7 (0.3)	1.5 (0.82)	0.79 (0.84)	254 (144)	0.103 (0.169)
BCC	6.7 (1.3)	1.6 (0.3)	4 (NA)	2.42 (2.49)	120 (96)	-0.707 (0.102)
GEMS	5.7 (0.8)	2.1 (0.3)	1.59 (0.51)	1.08 (0.52)	200 (81)	-0.342 (0.091)
GEOS	8.8 (1.5)	2.8 (0.4)	2.25 (1.18)	1.38 (0.97)	170 (79)	-0.336 (0.122)
GFDL	11.6 (2.9)	2.7 (0.4)	0.96 (0.42)	0.46 (0.56)	332 (187)	-0.673 (0.097)
HAD	7.6 (2.9)	2.3 (0.3)	2.22 (NA)	0.92 (21.79)	541 (352)	-0.02 (0.177)
MIROC	7.9 (1.1)	2.2 (0.2)	2.96 (0.87)	1.9 (0.66)	107 (31)	-0.553 (0.064)
MPI	6.3 (1)	1.7 (0.2)	1.82 (0.95)	0.59 (1.04)	186 (103)	-0.303 (0.104)
NCAR	9.1 (1.3)	2.4 (0.2)	2.02 (0.37)	0.95 (0.35)	147 (37)	-0.493 (0.055)

JJA CAM (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	3.6 (0.4)	1.6 (0.3)	0.1 (NA)	0.84 (0)	261 (223)	0.263 (0.156)
BCC	6 (1.3)	2.8 (0.6)	5 (NA)	4.76 (0.02)	113 (19)	-0.434 (0.171)
GEMS	6 (1)	2.5 (0.3)	1.81 (0.65)	1.11 (0.59)	184 (78)	0.156 (0.1)
GEOS	8.2 (1.4)	4.5 (1.1)	0.43 (0.22)	0.71 (0.16)	576 (420)	-0.671 (0.075)
GFDL	7.5 (1.8)	2.6 (0.3)	3.03 (2.09)	0.97 (1.28)	160 (98)	-0.11 (0.153)
HAD	5 (1)	3.1 (0.7)	2.22 (NA)	0.37 (0.99)	254 (153)	-0.142 (0.193)
MIROC	5.6 (0.9)	2.1 (0.2)	2.5 (0.47)	1.04 (0.45)	167 (43)	0.087 (0.086)
MPI	5.9 (1)	1.9 (0.2)	1.9 (0.93)	1.04 (0.86)	155 (72)	0 (0.116)
NCAR	9.2 (2.4)	3 (0.4)	1.02 (0.13)	0.55 (0.19)	443 (183)	-0.28 (0.063)

DJF CAM (Mid-N)

Table 18: Parameter estimates for the Amazon (AMZ) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	11.7 (3.9)	1.9 (0.2)	1.21 (0.17)	0.25 (0.41)	843 (364)	-0.232 (0.073)
BCC	21.4 (6.4)	4.7 (0.8)	2.31 (0.38)	1.28 (0.35)	485 (155)	-0.842 (0.03)
GEMS	11.6 (4.3)	3.7 (1.1)	0.85 (0.08)	0.64 (0.1)	931 (534)	0.062 (0.05)
GEOS	10.4 (1.6)	3 (0.3)	0.78 (0.13)	0.44 (0.21)	508 (193)	-0.626 (0.041)
GFDL	17.7 (5.1)	5 (0.9)	1.17 (0.14)	0.65 (0.17)	825 (335)	-0.843 (0.021)
HAD	8 (1.7)	2.7 (0.4)	0.89 (0.17)	0.46 (0.37)	689 (308)	-0.195 (0.094)
MIROC	9.9 (0.9)	2.9 (0.2)	2.35 (0.24)	1.45 (0.24)	155 (20)	-0.596 (0.029)
MPI	10.9 (1.5)	2.7 (0.2)	1.39 (0.19)	0.55 (0.25)	359 (85)	-0.641 (0.034)
NCAR	6.8 (0.5)	2.9 (0.2)	1.43 (0.1)	0.9 (0.12)	212 (28)	-0.512 (0.025)

JJA AMZ (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	12.5 (4.3)	1.4 (0.1)	1.24 (0.24)	0.17 (0.92)	685 (305)	0.305 (0.084)
BCC	9.2 (1.3)	1.9 (0.2)	4.67 (0.56)	1.49 (0.11)	204 (27)	-0.578 (0.051)
GEMS	12.4 (3.2)	2.6 (0.4)	0.95 (0.11)	0.54 (0.16)	562 (253)	-0.056 (0.048)
GEOS	10.9 (2.1)	2.8 (0.3)	0.74 (0.11)	0.35 (0.2)	716 (308)	-0.624 (0.041)
GFDL	11.6 (2.2)	2.4 (0.2)	1.73 (0.24)	0.47 (0.38)	379 (98)	-0.622 (0.04)
HAD	11.2 (2.9)	2 (0.2)	0.86 (0.29)	0.19 (0.99)	627 (403)	0.038 (0.095)
MIROC	9.5 (0.9)	2.2 (0.1)	2.68 (0.28)	1.19 (0.27)	143 (19)	-0.318 (0.04)
MPI	10.5 (2)	2 (0.1)	1.07 (0.16)	0.1 (16.98)	477 (156)	-0.259 (0.053)
NCAR	8.3 (0.8)	2.7 (0.3)	1.35 (0.12)	0.91 (0.14)	230 (41)	-0.152 (0.034)

DJF AMZ (Equat)

Table 19: Parameter estimates for Southern South America (SSA) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	8.6 (1.7)	2.2 (0.4)	1.68 (0.53)	0.85 (0.67)	322 (143)	0.467 (0.094)
BCC	5 (1)	2.1 (0.3)	5 (0.12)	2.47 (0)	166 (14)	-0.129 (0.135)
GEMS	8.9 (1.5)	3.3 (0.6)	2.38 (0.27)	1.46 (0.27)	233 (47)	0.338 (0.064)
GEOS	9.5 (2)	8 (3.3)	0.7 (0.15)	1.2 (0.13)	625 (318)	-0.539 (0.074)
GFDL	6.4 (1.2)	3 (0.5)	3.43 (1.45)	2.08 (0.96)	155 (65)	-0.473 (0.09)
HAD	10.4 (2.9)	2.3 (0.3)	3.26 (1.46)	0.74 (1.16)	212 (99)	-0.068 (0.154)
MIROC	9.9 (1.9)	2 (0.2)	2.68 (0.38)	0.43 (0.58)	228 (56)	0.125 (0.066)
MPI	8.6 (1.7)	2 (0.2)	1.52 (0.34)	0.42 (0.66)	305 (121)	0.262 (0.081)
NCAR	5.8 (0.7)	2.7 (0.2)	2.26 (0.21)	1.45 (0.2)	141 (21)	0.01 (0.051)

JJA SSA (Mid-S)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	10.3 (2.8)	3.5 (0.8)	1.35 (0.44)	1.14 (0.5)	358 (186)	0.558 (0.089)
BCC	10.6 (2.5)	4.1 (1.1)	3.63 (1.33)	2.83 (0.97)	203 (70)	0.555 (0.139)
GEMS	11.7 (1.8)	3 (0.4)	3.25 (0.37)	1.86 (0.29)	155 (26)	0.301 (0.067)
GEOS	16.1 (4.2)	3.7 (0.6)	1.3 (0.28)	0.91 (0.3)	397 (172)	-0.72 (0.049)
GFDL	10.1 (1.5)	3.5 (0.4)	4.36 (0.69)	1.91 (0.28)	147 (26)	-0.618 (0.063)
HAD	9 (2.1)	2.8 (0.4)	2.45 (1.08)	1.31 (1.09)	212 (99)	-0.519 (0.109)
MIROC	7.7 (0.9)	3.4 (0.4)	3.89 (0.69)	1.93 (0.33)	100 (18)	-0.054 (0.072)
MPI	9 (1)	3.3 (0.3)	2.67 (1.16)	1.99 (0.99)	117 (43)	-0.251 (0.1)
NCAR	10.9 (1.5)	2.2 (0.2)	3.43 (0.32)	1.5 (0.22)	109 (15)	-0.094 (0.051)

DJF SSA (Mid-S)

Table 20: Parameter estimates for Australia (AUS) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	18.1 (11)	9 (5.8)	1.06 (0.13)	1.03 (0.17)	3405 (2241)	-0.103 (0.106)
BCC	7.9 (4.2)	5.1 (2)	1.34 (0.21)	1.12 (0.21)	1118 (598)	-0.131 (0.123)
GEMS	30.1 (20.8)	6 (2.9)	1.05 (0.1)	0.77 (0.09)	4929 (3165)	0.093 (0.063)
GEOS	44.8 (23.9)	4.2 (1.3)	2.26 (0.22)	1.16 (0.29)	785 (281)	-0.565 (0.083)
GFDL	23.5 (15.5)	3.3 (1.3)	1.65 (0.22)	0.95 (0.2)	1306 (678)	-0.362 (0.102)
HAD	3.2 (0.9)	2.4 (0.5)	1.47 (1.03)	1.42 (0.98)	288 (209)	0.436 (0.1)
MIROC	23.2 (11.7)	2.8 (0.7)	1.72 (0.1)	0.82 (0.15)	1131 (423)	-0.38 (0.052)
MPI	3.2 (0.6)	1.3 (0.2)	3.06 (0.61)	1.88 (0.47)	176 (46)	-0.211 (0.076)
NCAR	50.7 (29.4)	6.9 (2.5)	1.5 (0.07)	0.91 (0.09)	1770 (775)	-0.625 (0.029)

JJA AUS (Mid-S)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.5 (1.4)	6.5 (2.2)	1.98 (0.27)	2.85 (0.37)	503 (140)	-0.162 (0.1)
BCC	10.7 (4)	5.3 (2.1)	1.59 (0.22)	1.46 (0.2)	1057 (419)	-0.127 (0.109)
GEMS	15 (7.7)	5.6 (2.3)	1.17 (0.08)	0.96 (0.07)	2350 (1080)	0.027 (0.062)
GEOS	7.4 (1.7)	7 (2)	1.28 (0.18)	1.5 (0.19)	645 (221)	-0.496 (0.065)
GFDL	8.1 (3)	5.6 (2.2)	1.15 (0.12)	1.2 (0.12)	1452 (658)	-0.645 (0.053)
HAD	6.7 (2.3)	12.2 (6)	0.91 (0.14)	1.43 (0.13)	1668 (846)	-0.574 (0.084)
MIROC	11 (2.9)	5.3 (1.2)	1.97 (0.13)	1.93 (0.11)	485 (94)	-0.234 (0.053)
MPI	5.6 (1.2)	6.3 (1.9)	1.47 (0.18)	2.14 (0.18)	529 (144)	-0.5 (0.059)
NCAR	11.4 (4.3)	6.6 (2.3)	1.3 (0.07)	1.14 (0.07)	1159 (403)	-0.075 (0.045)

DJF AUS (Mid-S)

Table 21: Parameter estimates for Southern Asia (SAS) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	8.4 (1.3)	3.1 (0.4)	4.99 (0.27)	3.1 (0)	109 (11)	-0.52 (0.102)
BCC	12.8 (2.3)	4.9 (0.9)	5 (NA)	3.52 (0)	154 (12)	-0.918 (0.024)
GEMS	11.7 (2.3)	2.4 (0.2)	1.37 (0.21)	0.39 (0.37)	321 (100)	-0.489 (0.057)
GEOS	16 (3.6)	2.8 (0.3)	1.62 (0.47)	0.53 (0.62)	310 (133)	-0.214 (0.105)
GFDL	10.2 (1.7)	3 (0.3)	5 (NA)	1.74 (0)	113 (9)	-0.537 (0.087)
HAD	9.6 (2.1)	2.9 (0.5)	2.37 (0.42)	2.1 (0.5)	313 (130)	-0.475 (0.117)
MIROC	14.4 (1.6)	3.7 (0.4)	4.99 (0.12)	3.03 (0)	86 (4)	-0.668 (0.044)
MPI	13 (2.1)	3.4 (0.4)	5 (0.01)	3.06 (0)	88 (7)	-0.619 (0.064)
NCAR	8.4 (0.8)	2.4 (0.2)	1.94 (0.46)	1.17 (0.45)	103 (27)	-0.58 (0.037)

JJA SAS (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	3.8 (0.8)	2.9 (0.4)	3.58 (1.97)	1.65 (1.17)	149 (75)	-0.158 (0.134)
BCC	6.4 (6.4)	4.6 (6.3)	4.86 (NA)	3.34 (2.72)	161 (331173)	-0.729 (2.156)
GEMS	7.3 (1.8)	2.2 (0.3)	1.58 (0.24)	0.47 (0.38)	349 (117)	-0.33 (0.071)
GEOS	8.1 (1.8)	2.7 (0.2)	1.81 (0.75)	0.28 (1.58)	237 (123)	-0.364 (0.095)
GFDL	7.4 (2)	3.6 (0.6)	2.74 (0.73)	1.15 (0.73)	198 (70)	-0.709 (0.066)
HAD	4.2 (0.6)	1.8 (0.2)	4.98 (0.73)	0.19 (NA)	91 (14)	-0.167 (0.136)
MIROC	4.6 (0.6)	2.6 (0.3)	5 (0.01)	2.11 (0)	84 (4)	-0.616 (0.051)
MPI	5.9 (0.9)	2.3 (0.2)	5 (0)	2.13 (0)	85 (7)	-0.445 (0.083)
NCAR	5.5 (0.8)	2 (0.1)	1.67 (0.3)	0.4 (0.46)	173 (49)	-0.411 (0.045)

DJF SAS (Equat)

Table 22: Parameter estimates for the Southern Pacific (ZSP) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	34.2 (18.4)	3.4 (1.3)	1.58 (0.06)	1.22 (0.07)	4308 (1589)	-0.05 (0.048)
BCC	5.2 (0.7)	1.5 (0.2)	2.89 (0.2)	3.45 (0.27)	430 (50)	0.221 (0.054)
GEMS	8.4 (2)	8 (3.8)	1.02 (0.03)	1.99 (0.02)	2637 (682)	0.382 (0.025)
GEOS	13.3 (3.5)	2.5 (0.7)	1.83 (0.07)	1.93 (0.06)	1353 (246)	0.543 (0.03)
GFDL	10.3 (2.4)	7.6 (2.8)	1.94 (0.07)	2.78 (0.07)	1311 (221)	0.11 (0.043)
HAD	37.7 (17.1)	11.9 (6.1)	1.65 (0.08)	2.12 (0.07)	2821 (877)	0.571 (0.04)
MIROC	3 (0.2)	0.7 (0)	3.95 (0.07)	5 (4.1)	146 (2)	0.395 (0.023)
MPI	3.5 (0.2)	2.6 (0.3)	3.07 (0.09)	5 (45.91)	196 (6)	-0.448 (0.029)
NCAR	174.3 (66.5)	11.9 (66.5)	1.63 (334.43)	1.6 (332.25)	8180 (10157593804)	-0.002 (23.55)

JJA ZSP (Mid-S)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	17.4 (6.6)	5 (1.9)	1.36 (0.05)	1.4 (0.05)	4090 (1253)	0.082 (0.048)
BCC	5.9 (0.9)	1.7 (0.3)	2.43 (0.18)	3.25 (0.25)	552 (75)	0.093 (0.057)
GEMS	6.2 (1.2)	13.4 (7.1)	0.96 (0.03)	2.28 (0.03)	2322 (575)	0.244 (0.027)
GEOS	22.9 (8.9)	3.7 (1.1)	1.87 (0.06)	1.64 (0.07)	1913 (446)	0.539 (0.03)
GFDL	8.3 (2)	4.3 (1.3)	1.69 (0.06)	2.43 (0.07)	1420 (235)	-0.058 (0.044)
HAD	33.4 (11.1)	9.2 (4.9)	1.59 (0.07)	1.85 (0.06)	3381 (1096)	0.005 (0.059)
MIROC	3.7 (0.2)	0.7 (0)	3.61 (0.06)	5 (5.11)	161 (2)	0.452 (0.021)
MPI	4.8 (0.3)	2.9 (0.3)	3.24 (0.1)	5 (NA)	199 (6)	-0.495 (0.028)
NCAR	40.2 (10.3)	9.7 (2.8)	1.4 (0.03)	1.68 (0.02)	6126 (1084)	-0.067 (0.021)

DJF ZSP (Mid-S)

Table 23: Parameter estimates for the Equatorial Pacific (ZEP) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	13.7 (2.3)	0.8 (0.1)	3.68 (0.28)	3.19 (0.26)	330 (43)	0.063 (0.056)
BCC	9.8 (1.1)	2.1 (0.2)	5 (0.01)	5 (0.03)	244 (8)	0.289 (0.06)
GEMS	9.5 (0.7)	1.7 (0.2)	2.26 (0.07)	3.49 (0.11)	298 (18)	0.217 (0.036)
GEOS	8.4 (0.9)	0.8 (0.1)	4.18 (0.31)	2.92 (0.14)	219 (21)	0.541 (0.033)
GFDL	10.2 (1.1)	1.2 (0.1)	4.81 (0.19)	4.47 (0.14)	229 (14)	0.257 (0.049)
HAD	12.4 (1.3)	1 (0.1)	2.92 (0.67)	1.85 (0.51)	225 (51)	0.616 (0.054)
MIROC	11.1 (0.7)	0.8 (0)	4.98 (0.07)	5 (0.25)	159 (3)	0.199 (0.029)
MPI	11.2 (0.7)	2.1 (0.3)	4.21 (0.12)	5 (18.61)	205 (7)	-0.368 (0.038)
NCAR	11.5 (0.9)	0.8 (0.1)	3.15 (0.05)	3.32 (0.06)	266 (11)	-0.079 (0.024)

JJA ZEP (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	15.2 (3.1)	0.9 (0.1)	2.59 (0.21)	2.41 (0.22)	514 (89)	0.119 (0.055)
BCC	8.8 (0.9)	1.8 (0.2)	5 (0)	5 (0.01)	235 (8)	0.528 (0.047)
GEMS	9.5 (0.7)	1.4 (0.2)	2.23 (0.08)	3.28 (0.11)	296 (20)	0.479 (0.026)
GEOS	10.6 (1.4)	0.7 (0.1)	4.62 (0.25)	2.72 (0.05)	234 (20)	0.454 (0.038)
GFDL	11.3 (1.3)	0.9 (0.1)	5 (0)	4.14 (0)	211 (7)	0.449 (0.042)
HAD	14.1 (1.5)	1.1 (0.1)	4.76 (0.05)	3.35 (0)	184 (10)	0.439 (0.064)
MIROC	9.3 (0.6)	1 (0.1)	4.47 (0.08)	5 (5.94)	175 (3)	0.13 (0.03)
MPI	13.5 (0.9)	1.8 (0.2)	4.51 (0.14)	5 (22.18)	189 (6)	-0.057 (0.044)
NCAR	7.5 (0.5)	0.8 (0.1)	2.78 (0.05)	3.34 (0.07)	263 (12)	-0.11 (0.024)

DJF ZEP (Equat)

Table 24: Parameter estimates for the Northern Pacific (ZNP) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	17.4 (5.8)	24.3 (15.6)	0.9 (0.05)	1.78 (0.05)	4954 (1931)	0.03 (0.054)
BCC	5.5 (1.1)	2.1 (0.5)	2.22 (0.17)	2.89 (0.21)	627 (111)	0.012 (0.061)
GEMS	7.2 (1.5)	5.1 (1.7)	0.93 (0.04)	1.76 (0.03)	1799 (414)	0.411 (0.026)
GEOS	32 (9.6)	14.8 (6.5)	1.28 (0.06)	1.82 (0.05)	2732 (746)	-0.851 (0.016)
GFDL	25 (7.4)	5.9 (2)	1.83 (0.07)	1.99 (0.07)	1911 (402)	-0.067 (0.051)
HAD	31.8 (14.3)	39.9 (20.3)	1.62 (0.09)	2.1 (0.1)	2761 (853)	-0.088 (0.064)
MIROC	4 (0.2)	1.4 (0.1)	3.38 (0.07)	5 (17.37)	173 (3)	0.121 (0.029)
MPI	5.5 (0.3)	1.8 (0.2)	3.64 (0.11)	5 (31.83)	194 (7)	-0.348 (0.035)
NCAR	28.3 (10.8)	4.1 (1.5)	1.47 (0.03)	1.49 (0.03)	2803 (785)	-0.282 (0.021)

JJA ZNP (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	12.6 (4.6)	28.3 (18.7)	0.76 (0.04)	1.58 (0.03)	8947 (4122)	-0.018 (0.052)
BCC	7 (1.1)	2 (0.4)	2.7 (0.16)	3.13 (0.19)	537 (67)	0.225 (0.059)
GEMS	29 (10.3)	29.4 (18.2)	1.11 (0.04)	1.83 (0.03)	4172 (1487)	0.546 (0.022)
GEOS	51.1 (19.6)	25.5 (12.1)	1.41 (0.06)	1.73 (0.05)	3953 (1178)	-0.772 (0.025)
GFDL	73.1 (29.8)	28.1 (13.8)	2.01 (0.06)	2.34 (0.07)	2846 (697)	0.063 (0.049)
HAD	54 (21.6)	29.9 (13.2)	1.94 (0.08)	2.35 (0.1)	2457 (602)	0.583 (0.043)
MIROC	4.2 (0.3)	1.5 (0.1)	2.89 (0.07)	3.95 (0.13)	268 (12)	0.315 (0.027)
MPI	4.8 (0.4)	1.1 (0.1)	3.82 (0.16)	4.37 (0.29)	192 (11)	-0.22 (0.041)
NCAR	112.6 (62.1)	7.7 (62.1)	1.57 (292.6)	1.32 (259.45)	6722 (5708297223)	-0.154 (22.085)

DJF ZNP (Mid-N)

Table 25: Parameter estimates for the East Equatorial Atlantic (ZEA) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	4.8 (1.1)	1.4 (0.5)	1.18 (0.17)	1.91 (0.18)	731 (248)	-0.338 (0.076)
BCC	7.1 (2)	2.2 (0.7)	2.85 (0.45)	3.56 (0.8)	441 (125)	0.061 (0.101)
GEMS	12.4 (2.8)	2.9 (1)	1.66 (0.07)	2.3 (0.07)	793 (148)	0.363 (0.044)
GEOS	15.7 (4.6)	1.4 (0.3)	2.3 (0.2)	1.71 (0.18)	615 (146)	0.105 (0.073)
GFDL	7.5 (1.9)	2.5 (0.7)	2.43 (0.2)	2.76 (0.21)	596 (115)	-0.39 (0.064)
HAD	11.3 (3.6)	3.1 (1.4)	1.21 (0.12)	1.76 (0.1)	1733 (617)	0.164 (0.096)
MIROC	6.8 (0.8)	0.9 (0.1)	4.98 (0.17)	5 (0.45)	129 (5)	0.039 (0.05)
MPI	7.3 (0.7)	2 (0.4)	4.15 (0.2)	5 (14.95)	190 (10)	-0.376 (0.053)
NCAR	5.2 (0.9)	5.5 (1.7)	1.34 (0.05)	2.1 (0.05)	790 (139)	0.067 (0.036)

JJA ZEA (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	14.3 (4.5)	2.3 (0.9)	1.64 (0.16)	1.92 (0.15)	1081 (329)	-0.261 (0.079)
BCC	10.6 (4.2)	1.8 (0.6)	2.45 (0.36)	2.44 (0.37)	658 (228)	0.122 (0.093)
GEMS	6.7 (1.2)	2.7 (0.9)	1.44 (0.08)	2.55 (0.07)	665 (117)	0.409 (0.042)
GEOS	42.7 (20.5)	1.4 (0.4)	2.03 (0.15)	1.28 (0.13)	1155 (359)	0.151 (0.069)
GFDL	11.8 (2.9)	1 (0.2)	3.6 (0.34)	3.31 (0.27)	307 (49)	0.362 (0.066)
HAD	13.5 (4.1)	1.1 (0.2)	1.56 (0.19)	1.48 (0.17)	969 (310)	0.346 (0.084)
MIROC	6.9 (1)	1.6 (0.2)	3.78 (0.23)	4.49 (0.63)	183 (18)	0.347 (0.043)
MPI	9.5 (0.9)	2.7 (0.5)	4.09 (0.19)	5 (14.99)	207 (10)	-0.257 (0.06)
NCAR	23.1 (6.9)	4.4 (1.4)	1.92 (0.05)	1.92 (0.05)	930 (178)	-0.186 (0.035)

DJF ZEA (Equat)

Table 26: Parameter estimates for the West Equatorial Atlantic (ZAE) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	19.8 (7.2)	1 (0.3)	2.36 (0.38)	2.35 (0.4)	496 (161)	-0.02 (0.108)
BCC	9.3 (1.7)	1 (0.2)	4.77 (0.35)	5 (9.14)	249 (15)	0.42 (0.1)
GEMS	8 (1.4)	1.1 (0.3)	1.57 (0.1)	2.74 (0.13)	457 (69)	0.3 (0.057)
GEOS	7.4 (1.1)	1 (0.2)	4.36 (0.52)	4.44 (0.8)	194 (28)	0.159 (0.091)
GFDL	18.1 (5.4)	2.5 (0.9)	2.32 (0.2)	2.64 (0.2)	769 (185)	0.348 (0.082)
HAD	18.4 (7.7)	1.4 (0.5)	2.07 (0.25)	2.37 (0.27)	723 (225)	0.583 (0.082)
MIROC	11.8 (1.4)	0.9 (0.1)	4.77 (0.19)	5 (6.04)	152 (5)	0.291 (0.054)
MPI	12.2 (1.4)	2.1 (0.4)	4.45 (0.25)	5 (24.58)	186 (11)	0.06 (0.077)
NCAR	26 (6.8)	1.6 (0.3)	2.37 (0.06)	2.22 (0.07)	633 (85)	-0.24 (0.042)

JJA ZAE (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	64.4 (44)	1.4 (0.5)	2.95 (0.32)	2.24 (0.3)	704 (254)	-0.15 (0.103)
BCC	6.1 (1.2)	1.1 (0.2)	4.06 (0.37)	5 (25.53)	247 (17)	0.53 (0.089)
GEMS	14.9 (2.8)	1.5 (0.4)	1.8 (0.11)	2.61 (0.12)	549 (96)	0.385 (0.054)
GEOS	4.8 (0.8)	0.8 (0.1)	2.47 (0.46)	3.16 (0.77)	281 (74)	-0.217 (0.082)
GFDL	34 (13.9)	2.3 (0.8)	2.92 (0.32)	2.56 (0.26)	614 (191)	0.635 (0.058)
HAD	22.8 (7.6)	1.4 (0.4)	2.3 (0.23)	2.23 (0.25)	697 (191)	0.481 (0.092)
MIROC	12.8 (1.7)	1 (0.2)	4.83 (0.21)	5 (4.45)	159 (8)	0.195 (0.057)
MPI	5.4 (0.6)	1.3 (0.2)	3.67 (0.21)	5 (31.26)	178 (10)	0.02 (0.078)
NCAR	17.8 (4.1)	1.2 (0.2)	2.6 (0.07)	2.69 (0.08)	415 (46)	-0.09 (0.044)

DJF ZAE (Equat)

Table 27: Parameter estimates for the North Atlantic (ZAN) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	9.5 (5.5)	2.2 (1.3)	1.27 (0.1)	1.34 (0.12)	2733 (1488)	-0.109 (0.09)
BCC	2.7 (0.5)	2.1 (0.6)	2.74 (0.36)	4.47 (1.64)	373 (75)	-0.151 (0.105)
GEMS	4.9 (1.2)	18.4 (8.9)	1.16 (0.07)	2.78 (0.08)	1055 (243)	0.518 (0.042)
GEOS	10.7 (4.4)	1.5 (0.6)	1.95 (0.12)	1.75 (0.13)	1166 (349)	-0.181 (0.073)
GFDL	24.2 (10.4)	9.5 (4.6)	2.14 (0.1)	2.64 (0.13)	1555 (384)	0.38 (0.074)
HAD	14.4 (8.2)	10.1 (5.3)	1.31 (0.12)	1.71 (0.1)	3027 (1253)	0.445 (0.083)
MIROC	3.3 (0.3)	0.9 (0.1)	3.81 (0.13)	5 (16.41)	150 (5)	0.406 (0.041)
MPI	2.6 (0.3)	1.2 (0.2)	3.15 (0.19)	5 (14.78)	164 (9)	-0.347 (0.06)
NCAR	5.3 (1.3)	7.1 (3.2)	1.56 (0.05)	2.73 (0.05)	1099 (218)	-0.167 (0.037)

JJA ZAN (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	3.7 (1.6)	6.6 (4)	0.94 (0.1)	1.75 (0.09)	2564 (1263)	-0.025 (0.092)
BCC	1.8 (0.4)	1.3 (0.3)	2.69 (0.47)	4.4 (2.94)	295 (73)	0.246 (0.101)
GEMS	5.1 (1.3)	14.5 (6.9)	1.11 (0.06)	2.59 (0.06)	1317 (319)	0.4 (0.046)
GEOS	5.5 (1.6)	3.4 (1.1)	2.15 (0.17)	2.61 (0.18)	734 (162)	-0.118 (0.082)
GFDL	4.4 (1.3)	4.8 (1.7)	2.26 (0.19)	3.58 (0.34)	609 (133)	0.462 (0.072)
HAD	22.1 (9.6)	13.4 (8.4)	1.48 (0.14)	1.95 (0.11)	2641 (1041)	0.868 (0.024)
MIROC	2.5 (0.2)	1.3 (0.2)	3.19 (0.1)	5 (NA)	184 (6)	0.454 (0.039)
MPI	2.6 (0.3)	0.9 (0.1)	3.36 (0.2)	5 (15.51)	153 (7)	0.191 (0.066)
NCAR	3.2 (0.7)	4.2 (1.3)	1.43 (0.05)	2.67 (0.06)	958 (158)	-0.001 (0.038)

DJF ZAN (Mid-N)

Table 28: Parameter estimates for the Far North Atlantic (ZAN) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	2.5 (0.3)	1.9 (0.4)	2.06 (0.21)	5 (21.97)	194 (12)	0.131 (0.097)
BCC	2.4 (0.5)	2.1 (0.4)	3.17 (0.34)	3.01 (0.34)	303 (52)	0.118 (0.095)
GEMS	2.2 (0.3)	2.9 (0.6)	1.36 (0.09)	2.21 (0.08)	390 (59)	0.227 (0.051)
GEOS	3.1 (0.6)	2 (0.4)	1.1 (0.14)	1.38 (0.13)	525 (144)	0.219 (0.07)
GFDL	6.4 (2.2)	3.1 (1)	1.79 (0.11)	1.73 (0.1)	936 (233)	-0.36 (0.072)
HAD	4 (1.2)	3 (0.9)	1.86 (0.27)	2.17 (0.31)	548 (168)	0.083 (0.101)
MIROC	3.2 (0.6)	1.7 (0.2)	2.74 (0.11)	2.7 (0.1)	248 (22)	0.053 (0.051)
MPI	6.7 (1.9)	2.4 (0.5)	2.05 (0.14)	1.96 (0.12)	494 (93)	-0.278 (0.067)
NCAR	9 (2.7)	2.7 (0.7)	1.72 (0.06)	1.68 (0.04)	927 (167)	0 (0.037)

JJA ZNA (Mid-N)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	2.1 (0.2)	3.5 (0.8)	1.4 (0.17)	5 (21.34)	211 (13)	0.124 (0.099)
BCC	5.5 (1.5)	4.4 (1.1)	2.44 (0.21)	2 (0.17)	577 (124)	0.476 (0.074)
GEMS	7.9 (3)	3.9 (1.4)	1.31 (0.08)	1.45 (0.07)	1157 (374)	0.368 (0.046)
GEOS	5.2 (1.9)	3.1 (0.9)	1.06 (0.1)	0.82 (0.1)	1566 (644)	-0.358 (0.072)
GFDL	3.9 (1.2)	3 (0.8)	1.94 (0.16)	1.99 (0.16)	540 (132)	0.582 (0.053)
HAD	3.9 (1.1)	3.7 (1.5)	1.31 (0.17)	1.89 (0.15)	887 (296)	0.508 (0.073)
MIROC	4.4 (0.8)	2.4 (0.4)	2.89 (0.1)	3.03 (0.1)	240 (21)	0.289 (0.047)
MPI	5.3 (1.5)	2.5 (0.5)	1.89 (0.14)	2.02 (0.13)	398 (77)	0.358 (0.063)
NCAR	4.5 (0.9)	5.3 (1.3)	1.79 (0.05)	2.24 (0.05)	530 (74)	0.599 (0.024)

DJF ZNA (Mid-N)

Table 29: Parameter estimates for the Southern Atlantic (ZSA) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	11.1 (5.1)	6.4 (3.1)	1.25 (0.06)	1.53 (0.09)	3170 (1309)	-0.006 (0.065)
BCC	3.9 (0.6)	3.2 (0.7)	2.64 (0.22)	3.03 (0.24)	435 (64)	0.531 (0.051)
GEMS	3.4 (0.5)	2.6 (0.7)	1.23 (0.07)	2.1 (0.06)	709 (125)	0.504 (0.029)
GEOS	11.1 (4.2)	7.4 (3.6)	2.53 (0.16)	2.73 (0.19)	727 (177)	0.201 (0.062)
GFDL	8.9 (2.7)	4 (1.4)	2.13 (0.11)	2.28 (0.12)	1056 (230)	0.568 (0.04)
HAD	5.3 (1.2)	2.7 (1.1)	1.29 (0.14)	1.86 (0.13)	1108 (394)	0.663 (0.042)
MIROC	3.4 (0.3)	1.1 (0.1)	3.38 (0.11)	4.24 (0.17)	192 (9)	0.474 (0.029)
MPI	3.7 (0.3)	1.6 (0.2)	3.87 (0.13)	5 (8.11)	164 (5)	0.098 (0.048)
NCAR	16 (2.9)	25 (6.1)	1.93 (0.04)	2.64 (0.04)	1219 (124)	0.12 (0.028)

JJA ZSA (Mid-S)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	12.8 (5.4)	9 (4.1)	1.32 (0.07)	1.76 (0.1)	2483 (910)	0.056 (0.065)
BCC	5.5 (0.9)	3.1 (0.6)	2.8 (0.19)	3.27 (0.24)	457 (57)	0.021 (0.072)
GEMS	4.1 (0.8)	8.2 (3.5)	1.08 (0.05)	2.05 (0.04)	1405 (326)	0.318 (0.034)
GEOS	20.1 (6.5)	3.5 (0.9)	2.94 (0.12)	2.54 (0.14)	686 (110)	-0.074 (0.056)
GFDL	7 (1.7)	2.8 (0.7)	2.16 (0.1)	2.38 (0.12)	824 (131)	0.227 (0.055)
HAD	10.3 (3.1)	3.8 (1.4)	1.51 (0.11)	1.57 (0.11)	1763 (606)	0.183 (0.075)
MIROC	3.2 (0.2)	1.3 (0.1)	3.22 (0.1)	4.41 (0.23)	199 (9)	0.289 (0.033)
MPI	3.9 (0.3)	2 (0.2)	3.68 (0.12)	5 (8.42)	177 (6)	-0.272 (0.046)
NCAR	6.7 (1.2)	3.9 (1)	1.85 (0.06)	2.54 (0.05)	648 (78)	0.135 (0.028)

DJF ZSA (Mid-S)

Table 30: Parameter estimates for the Equatorial Indian Ocean (ZEI) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	6.3 (0.9)	1.9 (0.5)	1.41 (0.17)	2.51 (0.23)	511 (113)	-0.179 (0.064)
BCC	11.9 (3.3)	0.9 (0.1)	3.14 (0.32)	2.05 (0.25)	447 (86)	-0.015 (0.073)
GEMS	9.1 (1.5)	0.9 (0.1)	1.3 (0.09)	1.07 (0.09)	531 (103)	0.168 (0.038)
GEOS	27 (9)	1.6 (0.3)	1.55 (0.09)	0.78 (0.13)	1243 (349)	-0.556 (0.038)
GFDL	27.6 (12.7)	2.5 (0.8)	1.51 (0.08)	1.03 (0.12)	2025 (738)	-0.061 (0.058)
HAD	16.7 (5.8)	1.3 (0.4)	1.28 (0.16)	1.13 (0.18)	1196 (514)	-0.018 (0.081)
MIROC	7.6 (0.6)	1.2 (0.1)	2.53 (0.13)	2.85 (0.16)	189 (14)	-0.231 (0.035)
MPI	7.5 (0.7)	1.4 (0.2)	1.5 (0.17)	2.33 (0.18)	311 (54)	0.037 (0.049)
NCAR	7.9 (1.4)	1.8 (0.3)	1.34 (0.04)	1.17 (0.05)	791 (129)	-0.125 (0.027)

JJA ZEI (Equat)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	12.1 (3.7)	5.1 (2.5)	1.11 (0.09)	1.8 (0.11)	1660 (648)	-0.163 (0.065)
BCC	15.8 (4.7)	1.3 (0.3)	2.09 (0.18)	1.62 (0.17)	811 (205)	0.35 (0.066)
GEMS	24.5 (11.4)	3.1 (1.4)	0.9 (0.04)	0.85 (0.04)	4357 (2461)	0.553 (0.027)
GEOS	139.6 (101.5)	3.8 (1.5)	1.31 (0.06)	0.66 (0.12)	6931 (4052)	-0.47 (0.046)
GFDL	33.3 (15.9)	3 (1.2)	1.53 (0.08)	1.15 (0.09)	2519 (1025)	0.289 (0.054)
HAD	33.3 (17.6)	2.7 (1.1)	1.21 (0.09)	0.99 (0.1)	3224 (1573)	0.336 (0.072)
MIROC	9.8 (1.3)	1.1 (0.1)	2.23 (0.09)	1.91 (0.09)	349 (34)	-0.241 (0.035)
MPI	6.8 (0.4)	1.1 (0.2)	3.24 (0.49)	4.62 (1.86)	144 (20)	0.438 (0.046)
NCAR	22.3 (8)	7.6 (2.8)	1.4 (0.04)	1.39 (0.04)	1616 (462)	-0.171 (0.027)

DJF ZEI (Equat)

Table 31: Parameter estimates for the Southern Indian Ocean (ZSI) by season with asymptotic standard errors in parentheses

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	1.3 (0.1)	1.1 (0.2)	2.07 (0.12)	5 (27.31)	220 (9)	0.038 (0.06)
BCC	3.4 (0.5)	2 (0.3)	3.27 (0.23)	3.64 (0.29)	311 (33)	0.429 (0.054)
GEMS	16.8 (8.2)	5.2 (3)	1.06 (0.04)	1.21 (0.03)	4313 (2135)	0.448 (0.028)
GEOS	3 (0.6)	1.9 (0.5)	1.29 (0.09)	1.71 (0.08)	803 (188)	-0.27 (0.059)
GFDL	5 (0.9)	1.6 (0.3)	2.19 (0.11)	2.38 (0.1)	561 (71)	0.529 (0.038)
HAD	13 (4.8)	6.2 (3)	1.24 (0.1)	1.42 (0.1)	2390 (1236)	0.683 (0.036)
MIROC	4.4 (0.4)	0.6 (0)	4.02 (0.11)	4.11 (0.11)	162 (7)	0.399 (0.028)
MPI	3.2 (0.4)	0.8 (0.1)	1.82 (0.1)	1.79 (0.09)	354 (38)	0.325 (0.044)
NCAR	7.1 (1.8)	2.5 (0.7)	1.76 (0.04)	1.89 (0.03)	976 (163)	0.283 (0.023)

JJA ZSI (Mid-S)

	σ_P	σ_T	ν_P	ν_T	a^{-1}	ρ
NCEP/GPCP	2.5 (0.4)	2.7 (0.7)	1.36 (0.12)	2.86 (0.18)	615 (123)	0.008 (0.06)
BCC	6.7 (1.2)	3 (0.6)	2.52 (0.14)	2.77 (0.13)	586 (72)	0.195 (0.063)
GEMS	5 (1.1)	3.5 (1.3)	1.1 (0.05)	1.76 (0.04)	1312 (334)	0.186 (0.034)
GEOS	11.7 (4.3)	14.7 (8.6)	1.05 (0.05)	1.62 (0.05)	3707 (1462)	0.312 (0.046)
GFDL	9.4 (2.6)	3 (0.9)	1.76 (0.09)	1.86 (0.08)	1204 (267)	-0.127 (0.055)
HAD	15.1 (6.9)	7.3 (3)	1.35 (0.09)	1.41 (0.09)	3032 (1345)	0.442 (0.056)
MIROC	5.6 (0.8)	1.1 (0.1)	2.61 (0.09)	2.69 (0.07)	351 (25)	0.149 (0.032)
MPI	6.2 (0.8)	1.8 (0.3)	2.08 (0.1)	2.27 (0.08)	458 (47)	-0.588 (0.03)
NCAR	26.2 (10.5)	4 (1.4)	1.67 (0.04)	1.61 (0.03)	1964 (499)	0.072 (0.025)

DJF ZSI (Mid-S)