

Tropical and Mid-Latitude Covariance Comparison for AIRS brightness temperatures

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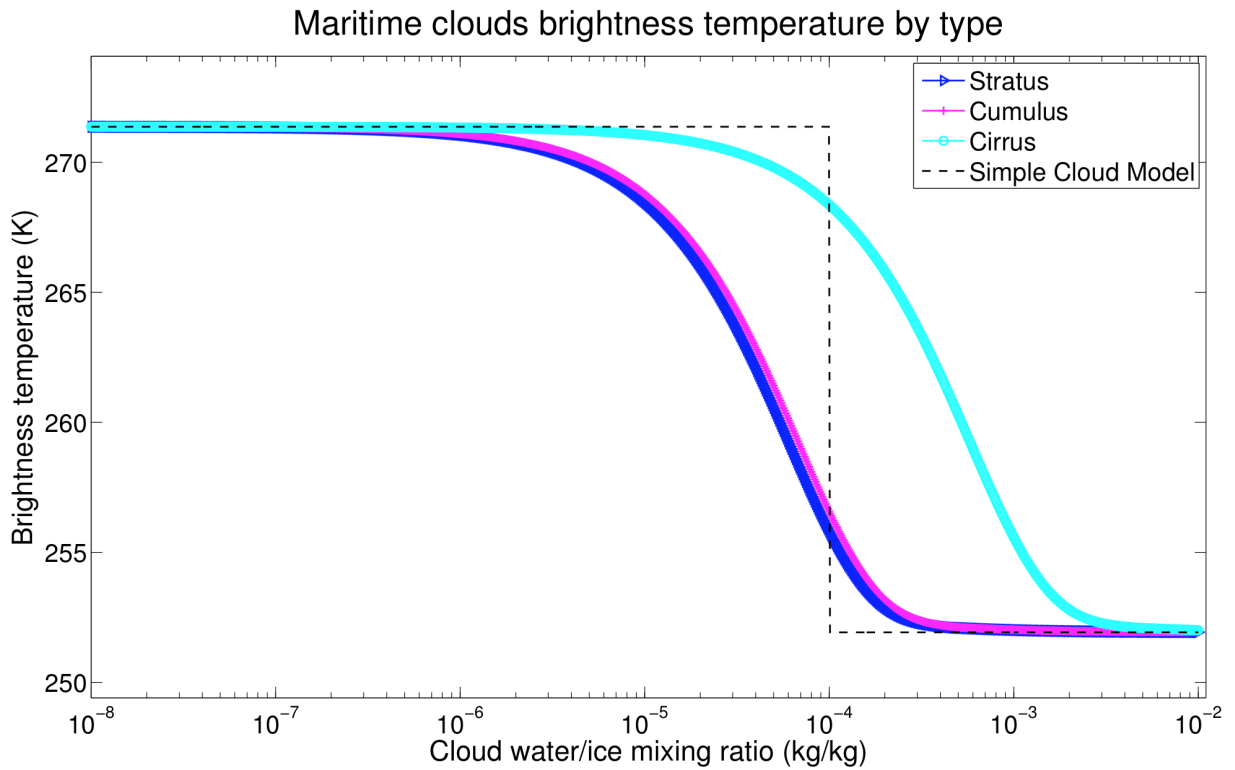


Figure 1: AIRS Brightness Temperature drop as a function of cloud mixing ratio for a single cloud, 300 m thick, 6 km high versus a clear-sky tropical maritime profile. AIRS channel 300 (wavelength of 13.593 μ m) is used.

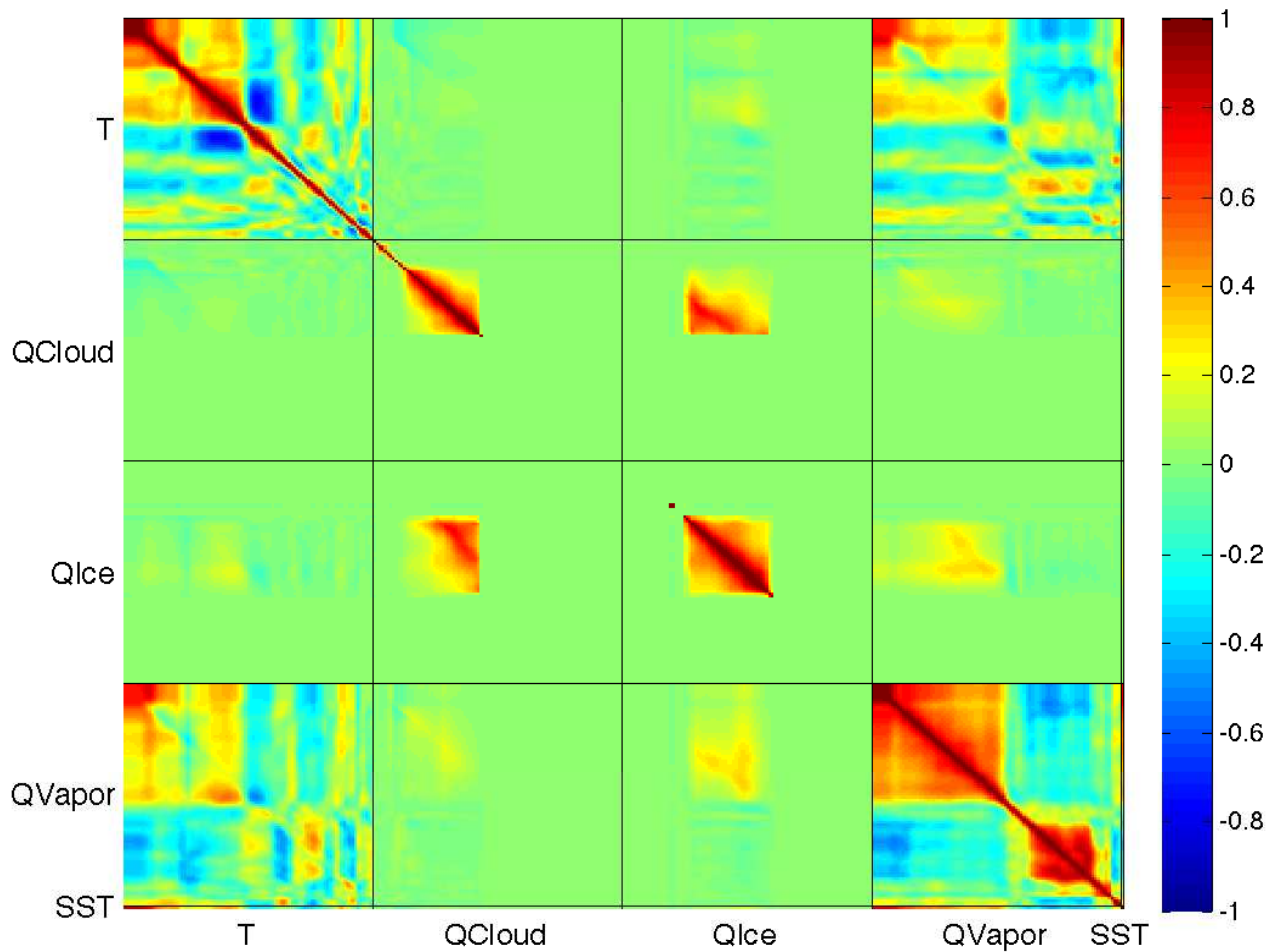


Figure 2: Tropical model covariance, global

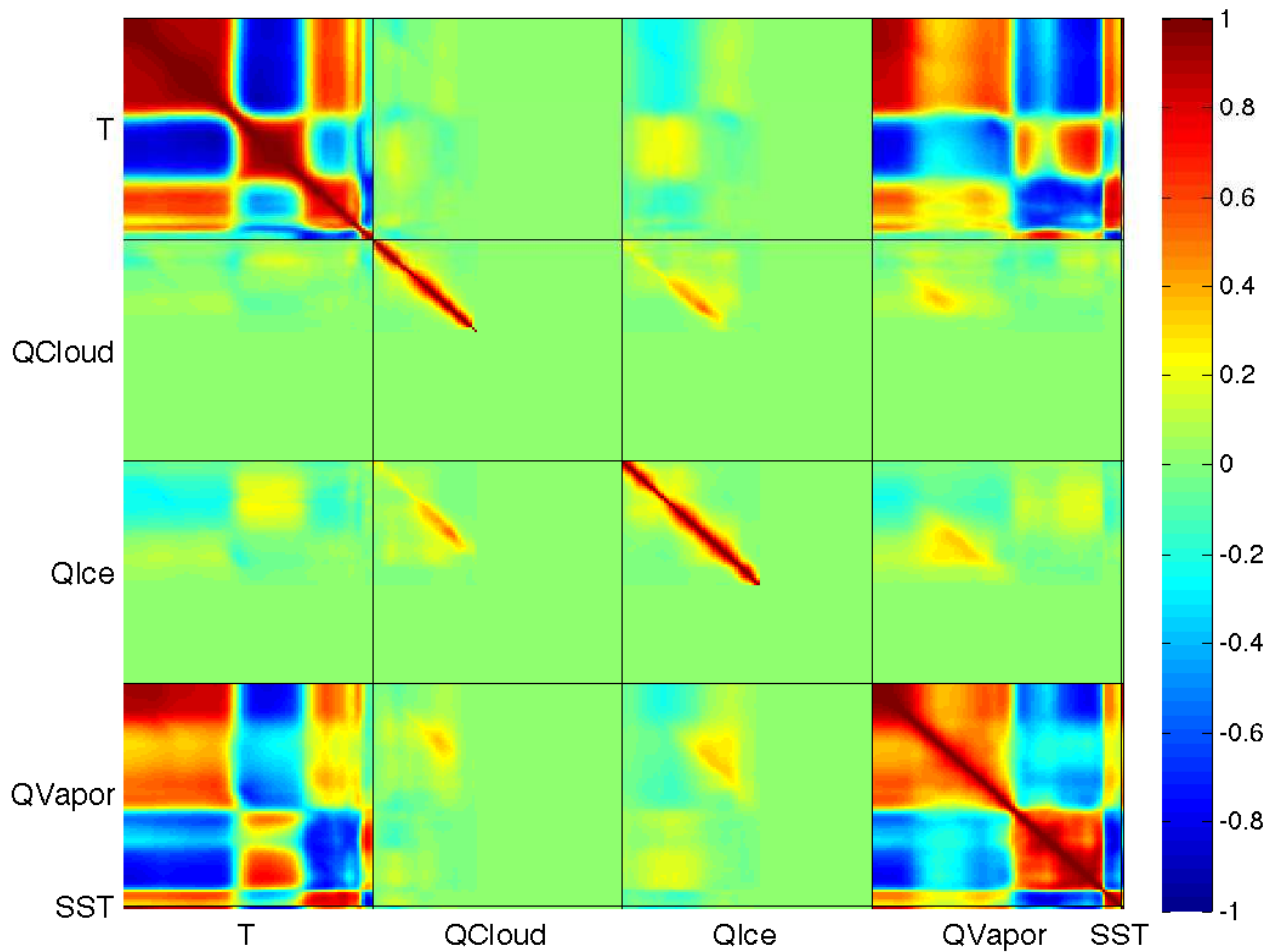


Figure 3: Mid-latitude model covariance, global

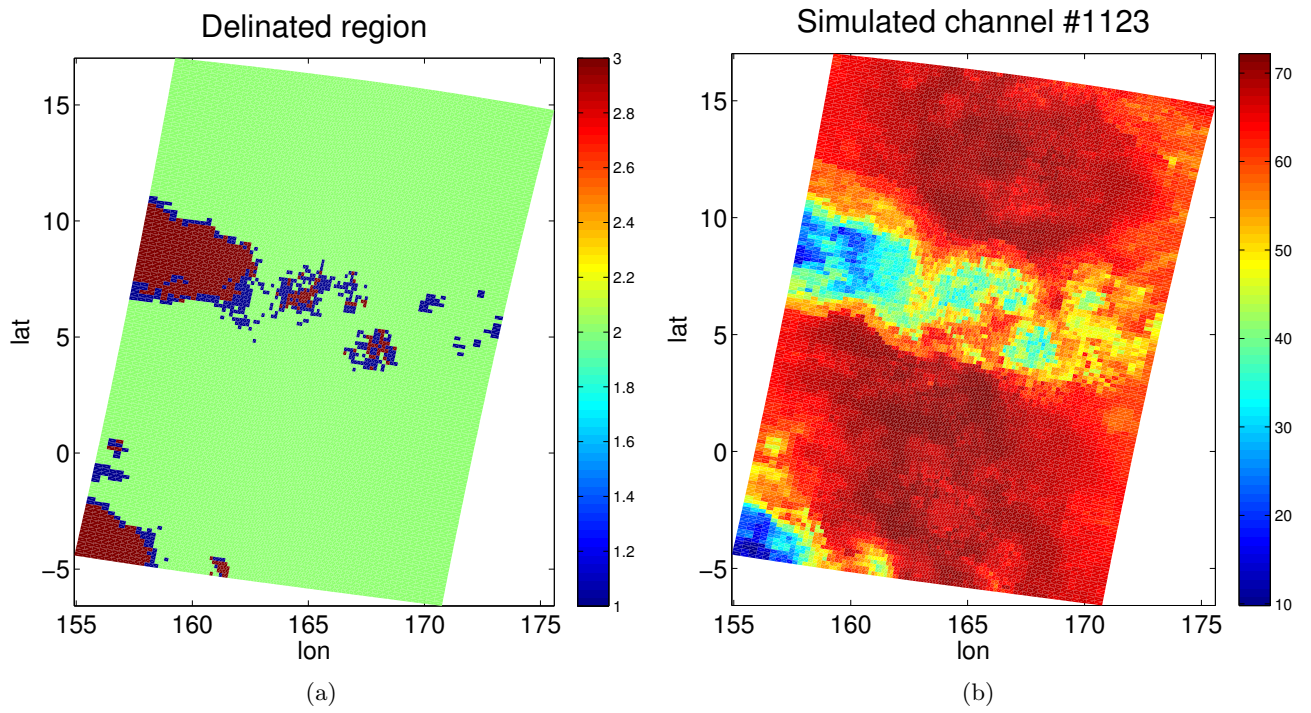


Figure 4: Tropical region discriminant comparison

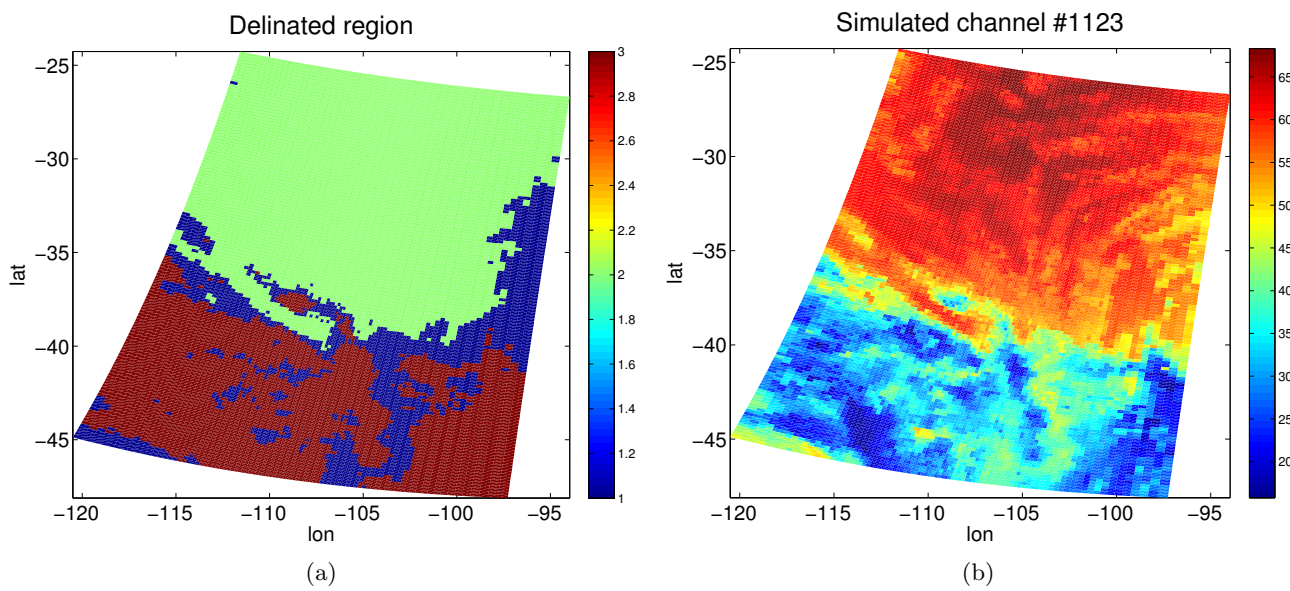


Figure 5: Mid-latitude region discriminant comparison

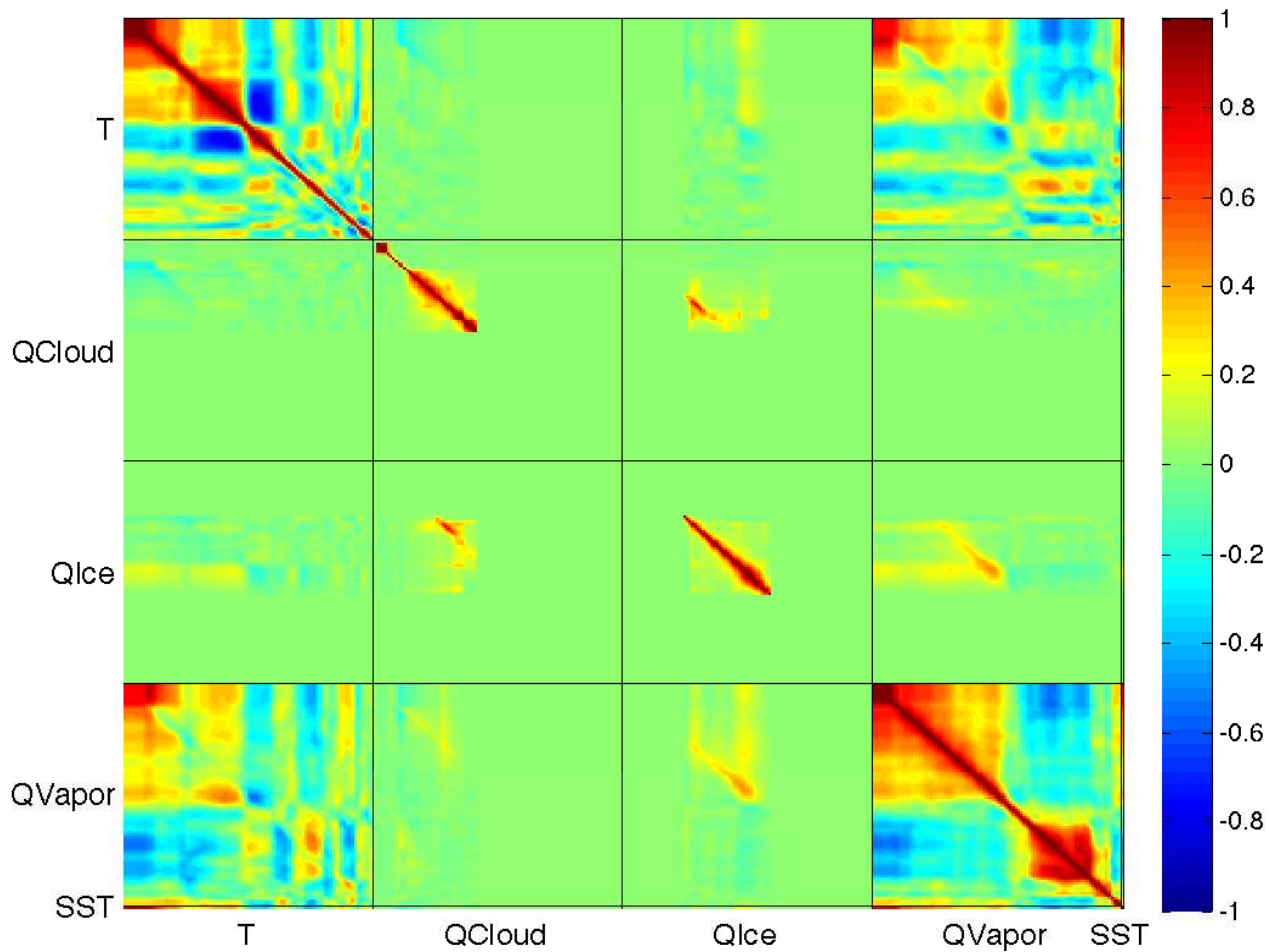


Figure 6: Tropical model covariance, region 1

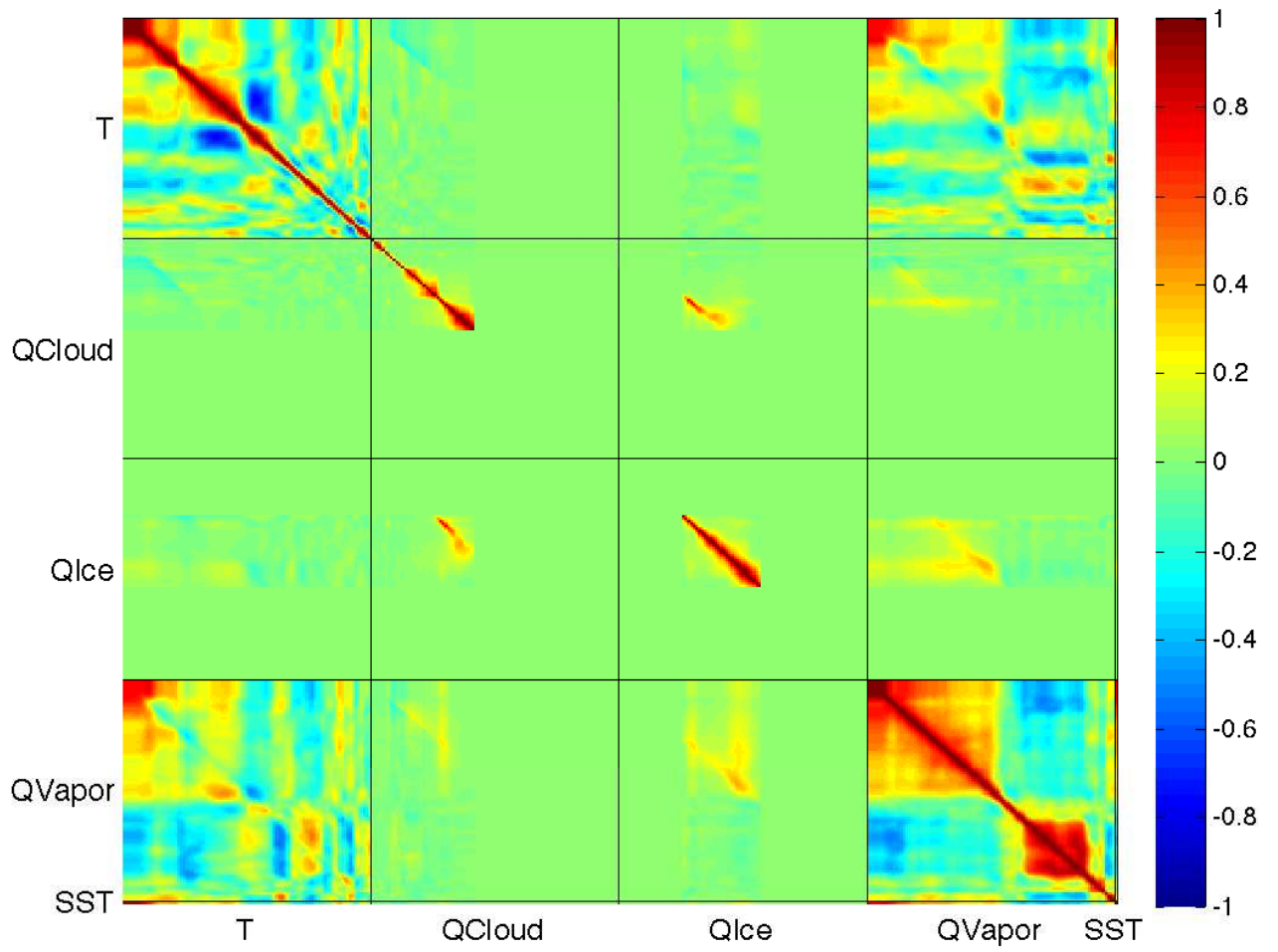


Figure 7: Tropical model covariance, region 2

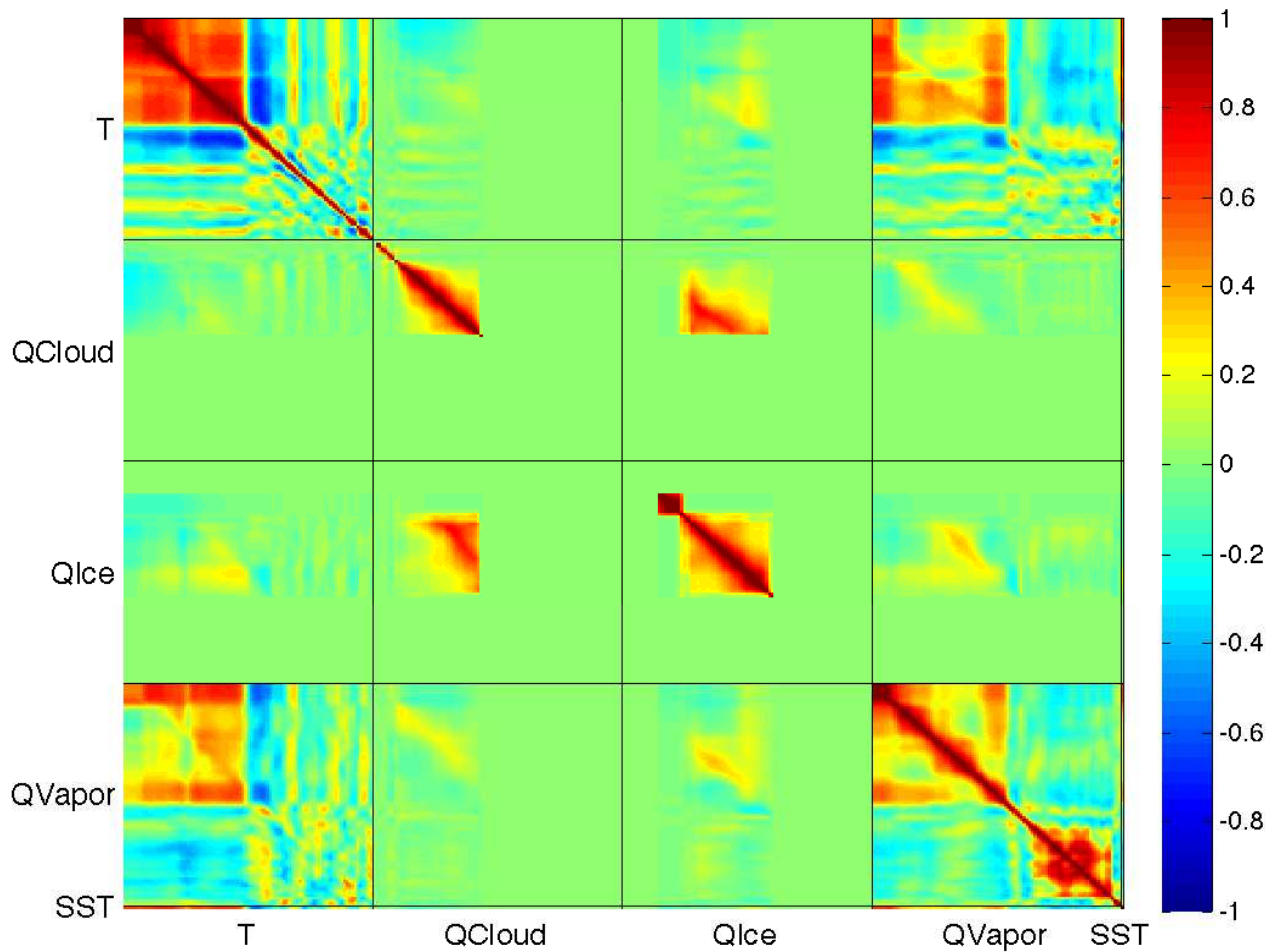


Figure 8: Tropical model covariance, region 3

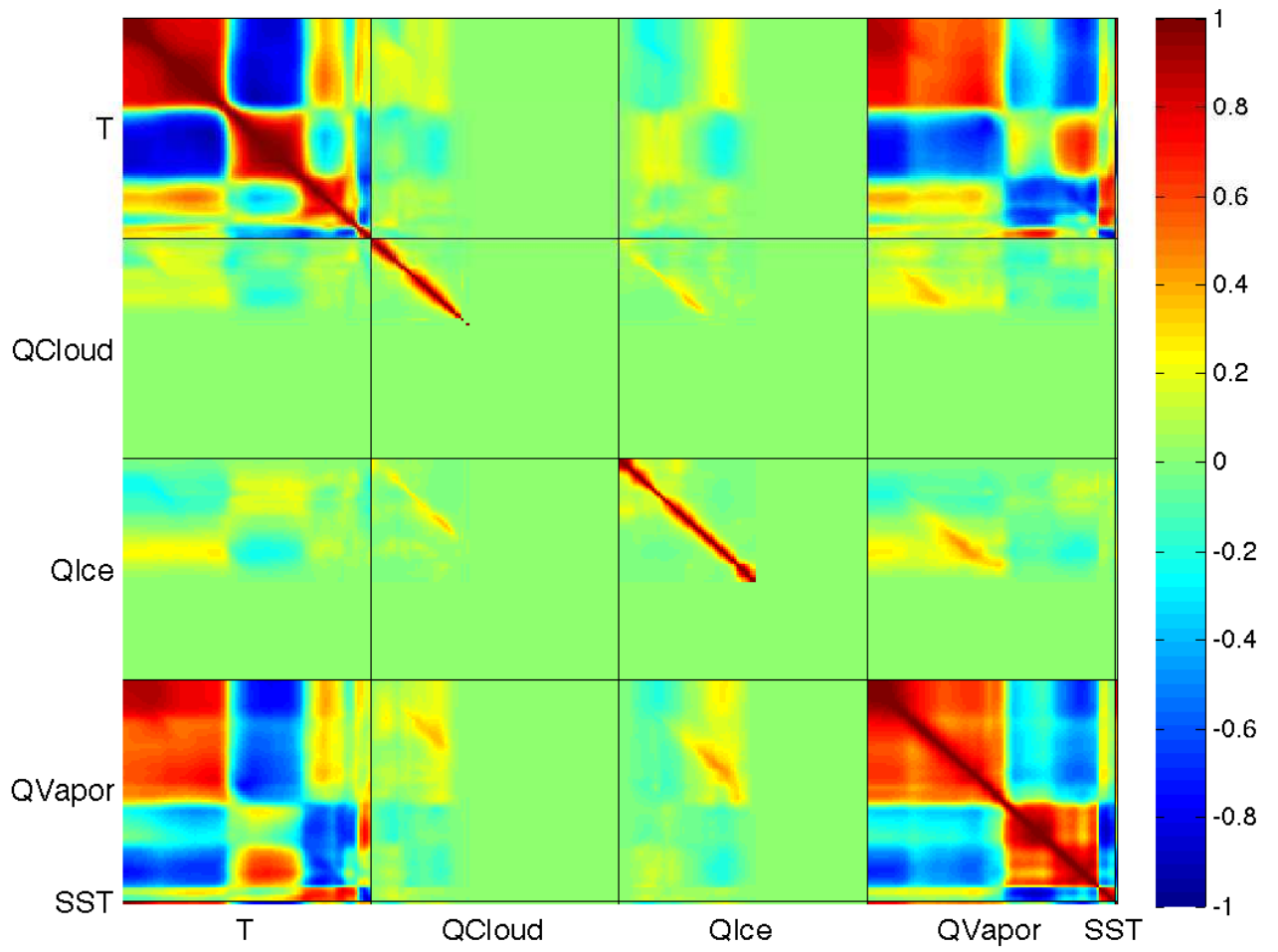


Figure 9: Mid-latitude model covariance, region 1

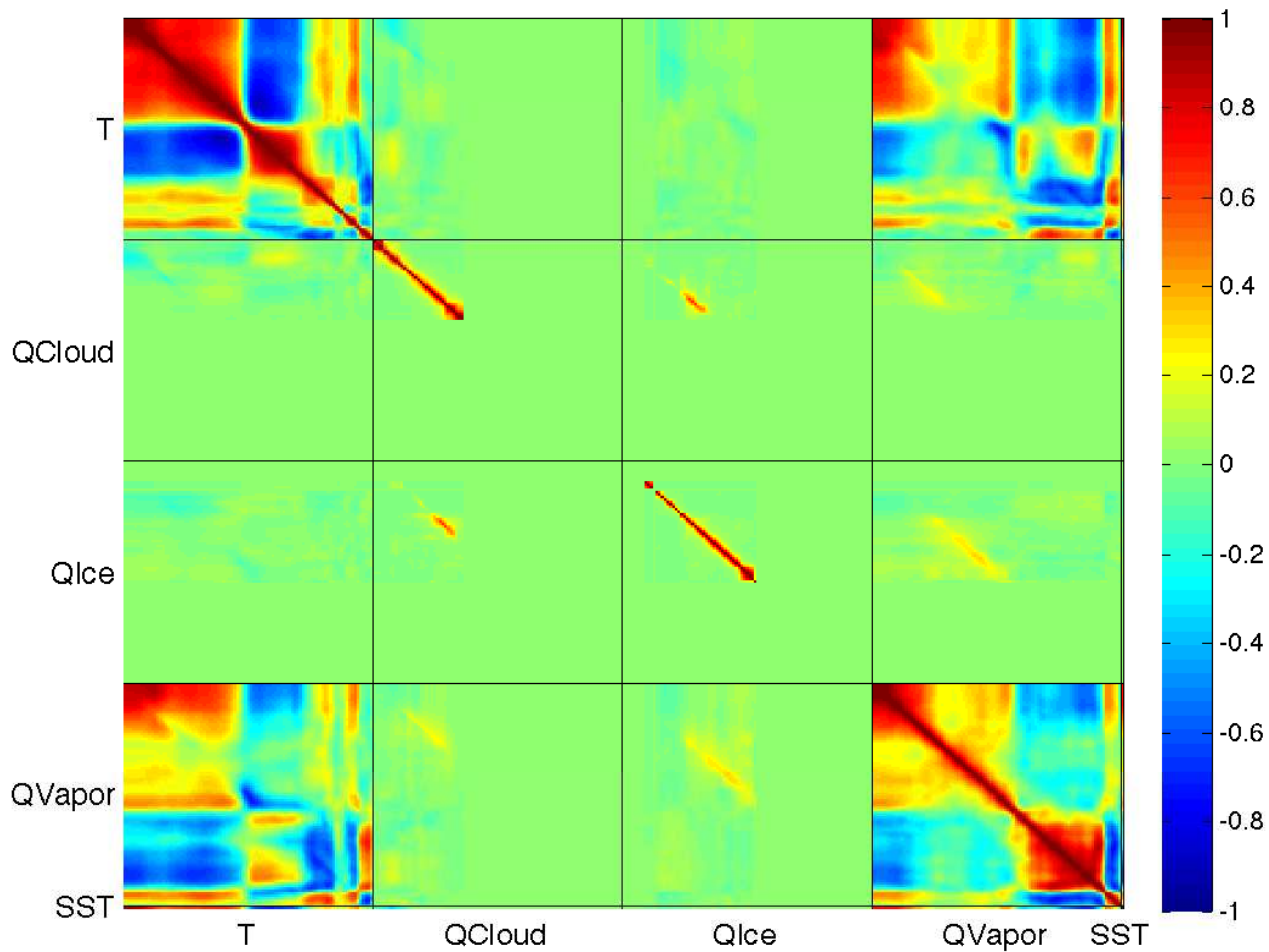


Figure 10: Mid-latitude model covariance, region 2

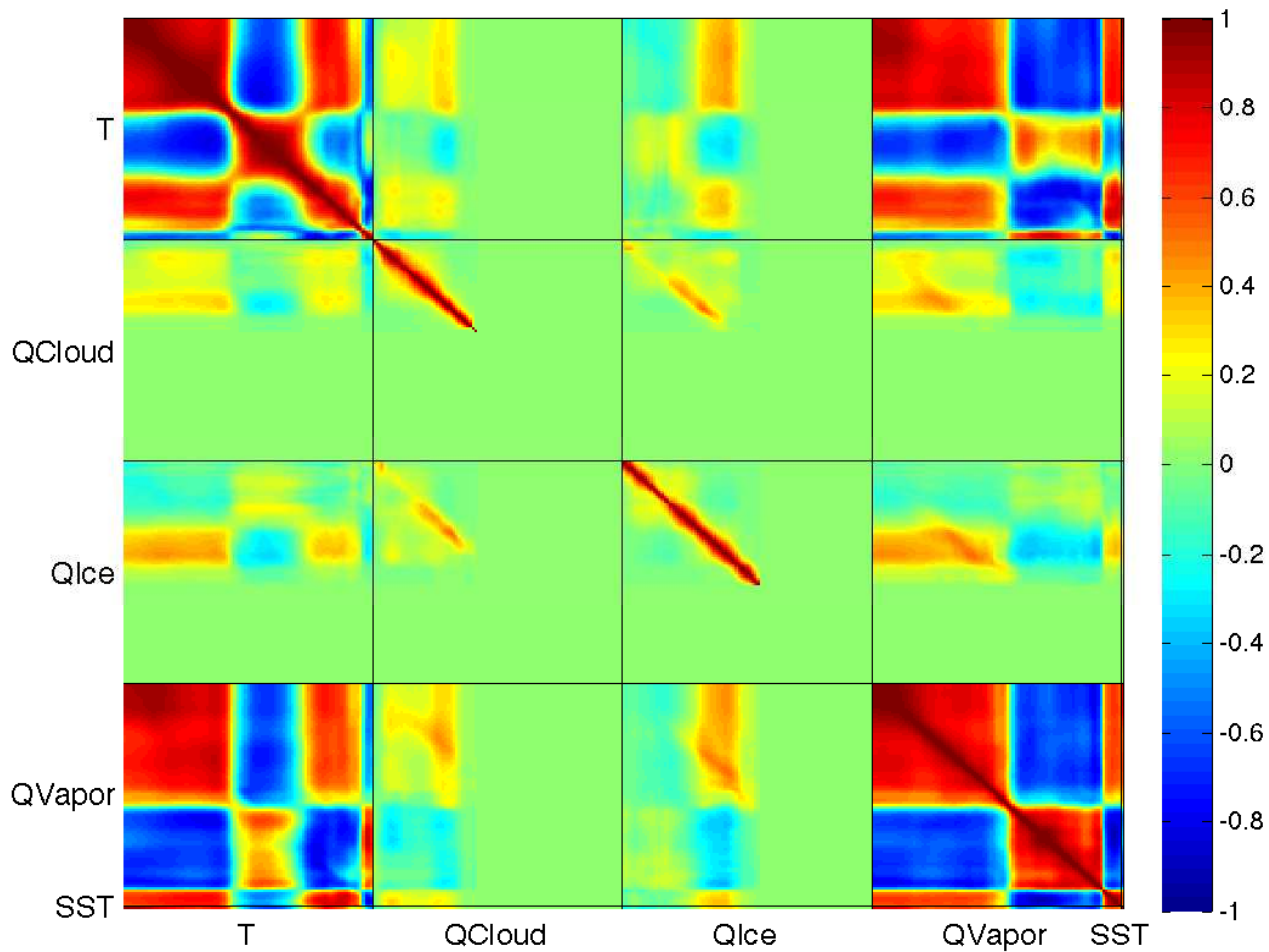


Figure 11: Mid-latitude model covariance, region 3

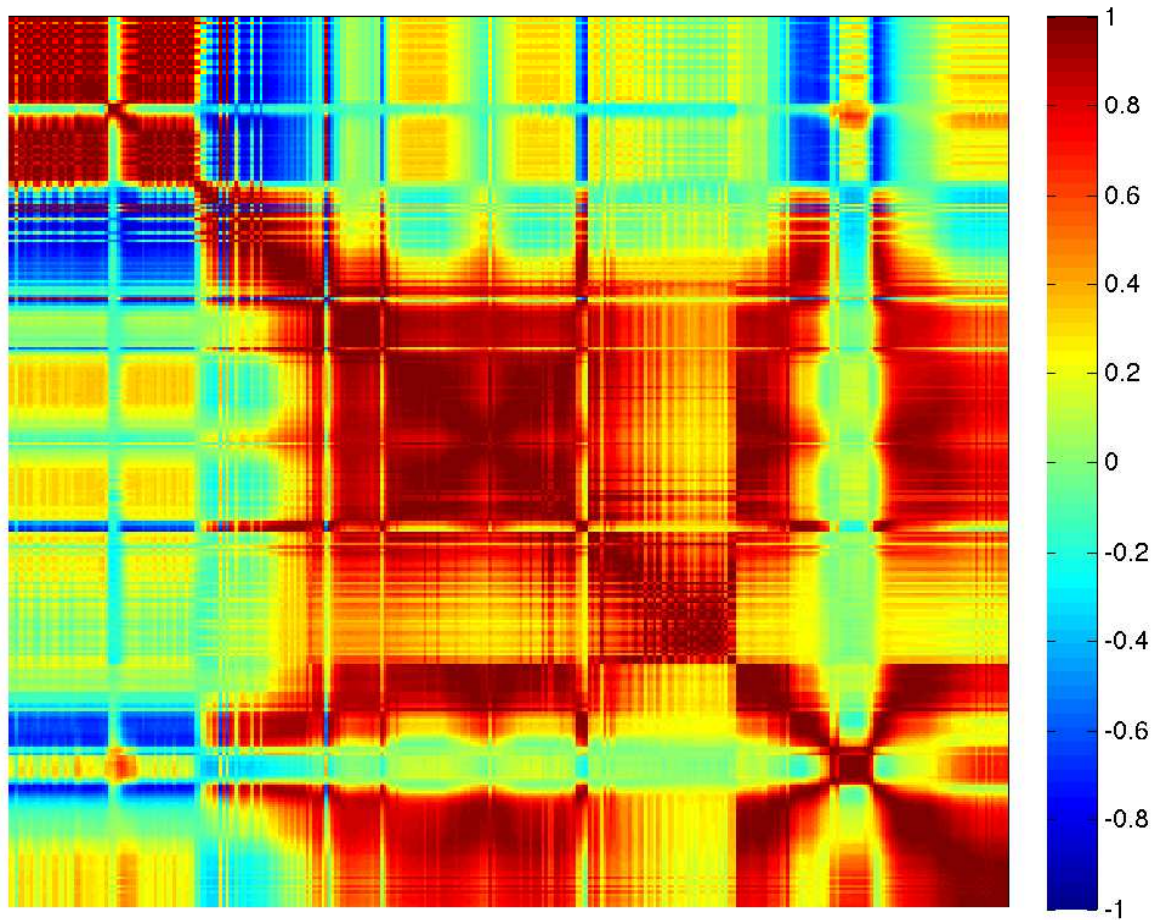


Figure 12: Tropical observation covariance, region 1

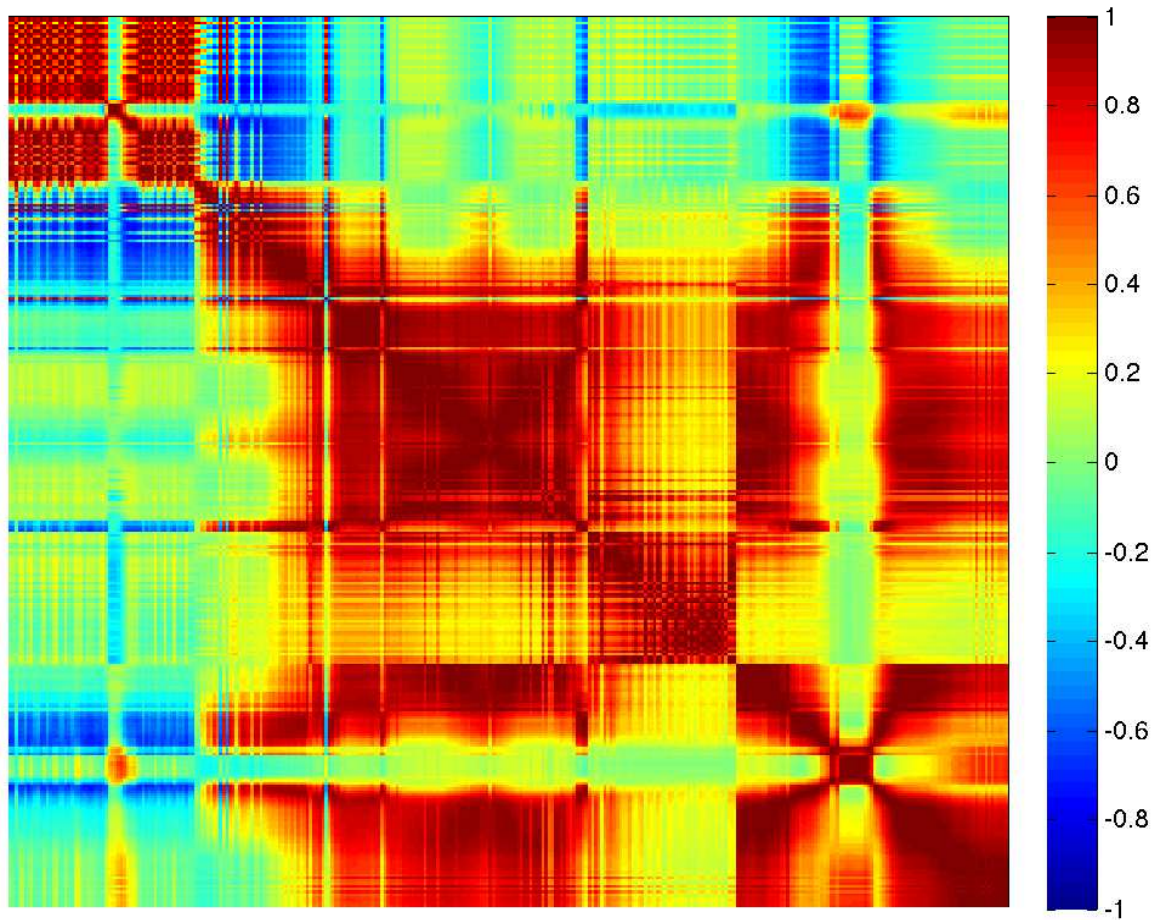


Figure 13: Tropical observation covariance, region 2

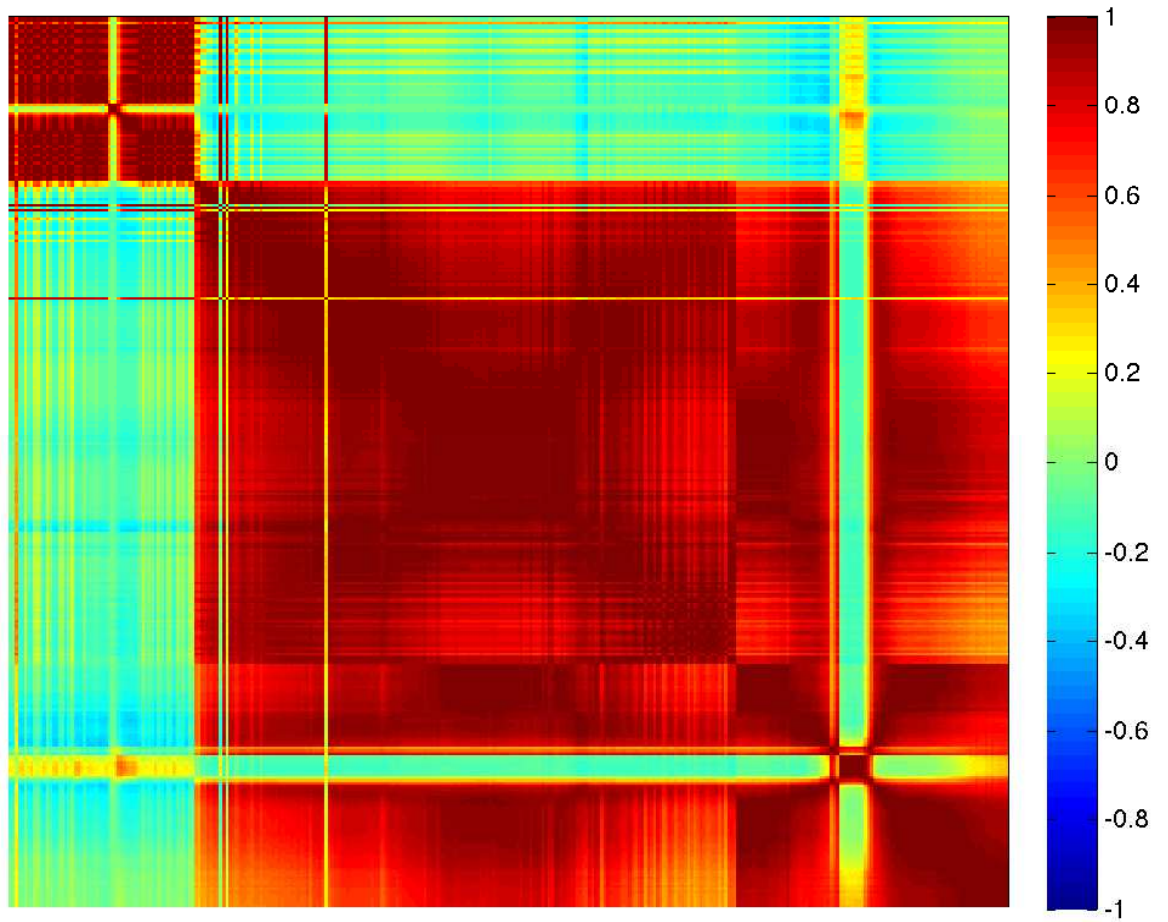


Figure 14: Tropical observation covariance, region 3

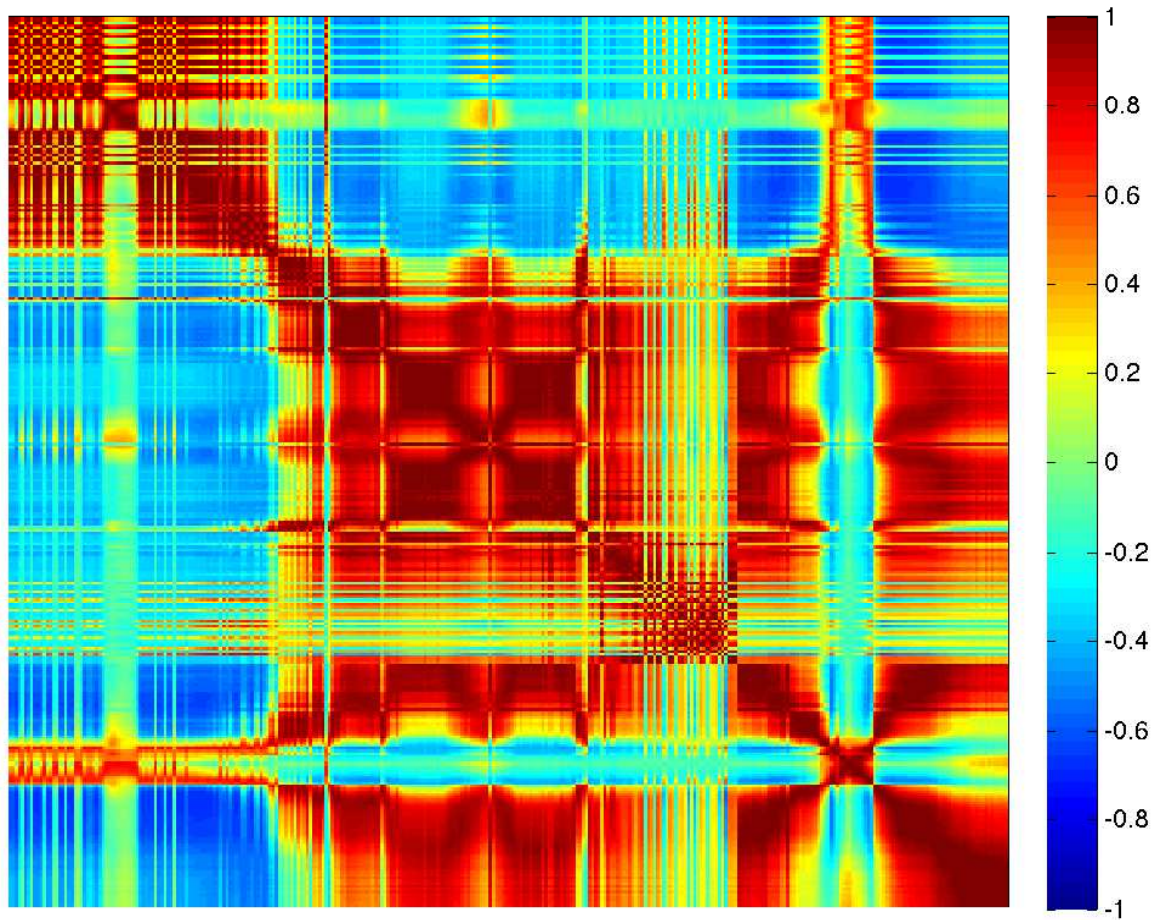


Figure 15: Mid-latitude observation covariance, region 1

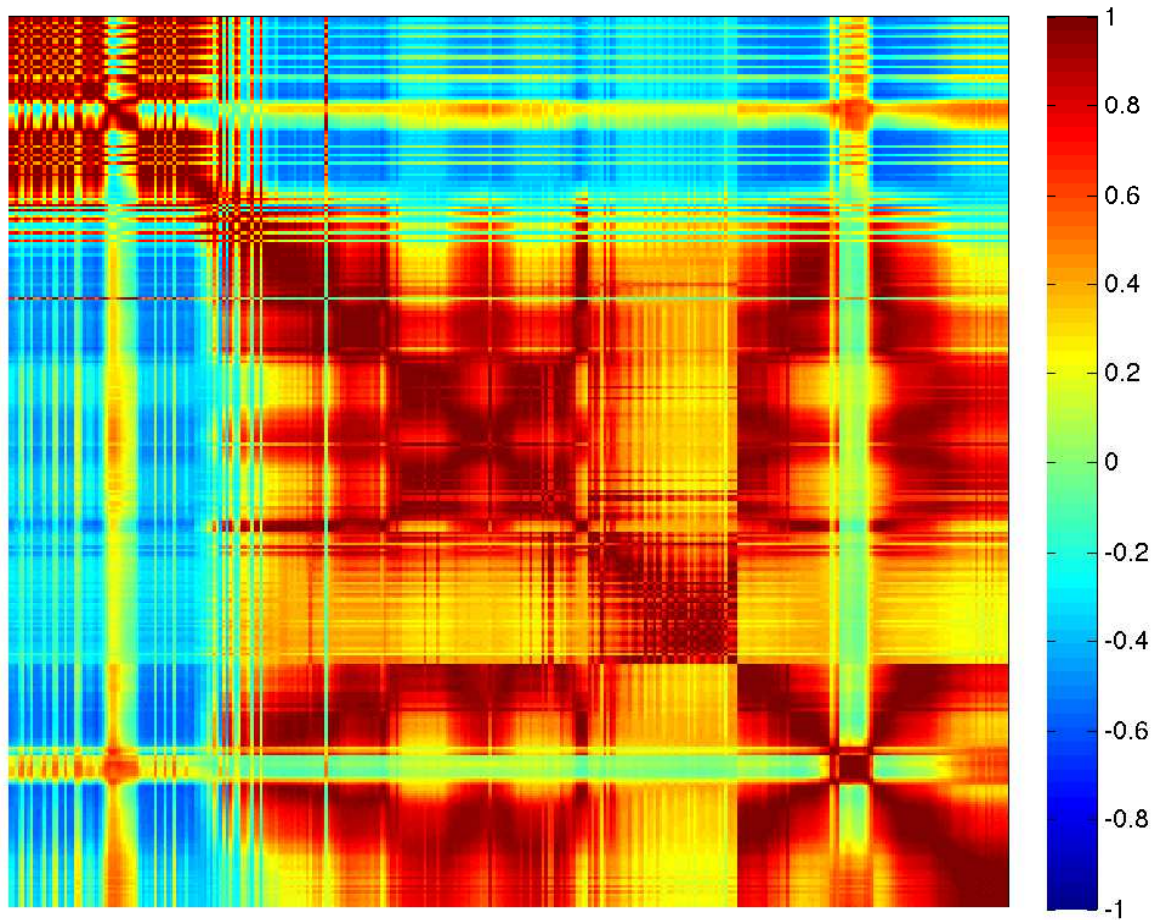


Figure 16: Mid-latitude observation covariance, region 2

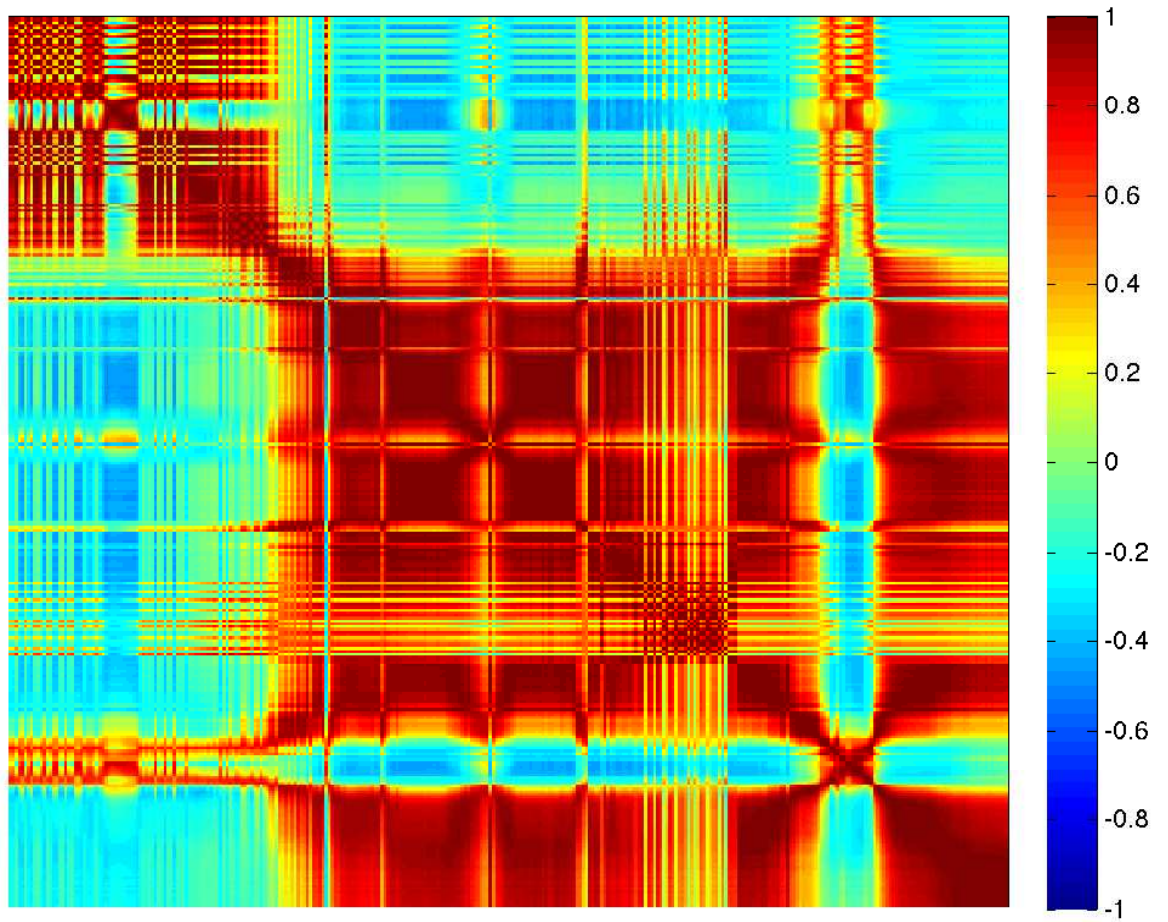
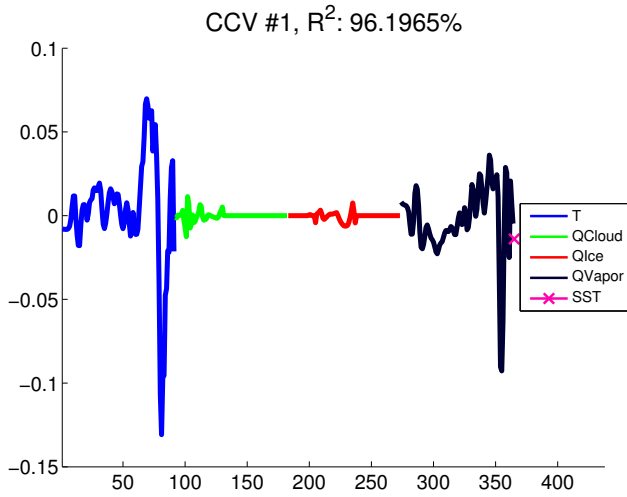
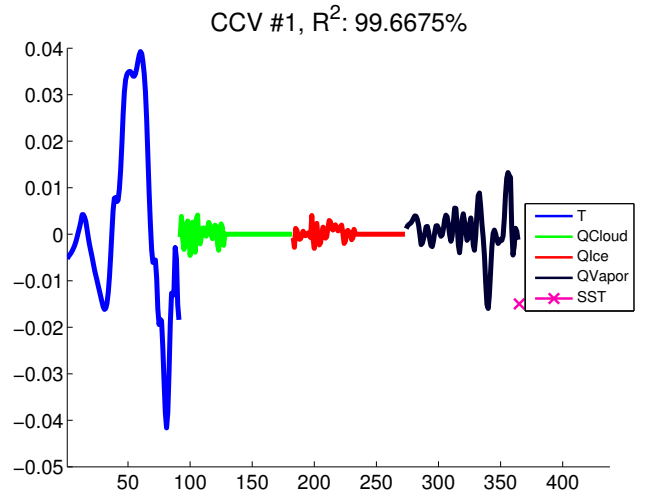


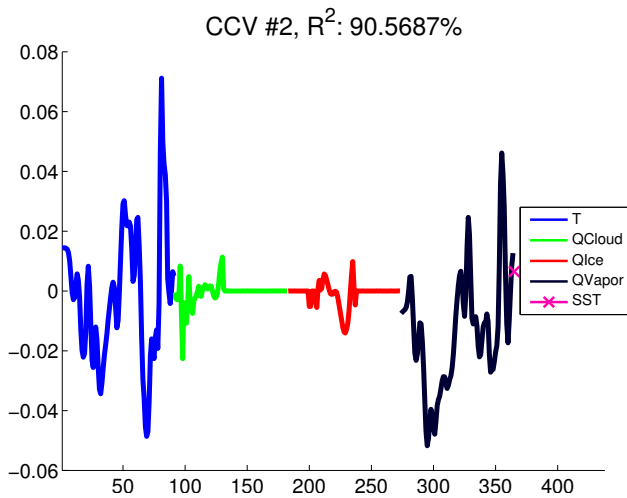
Figure 17: Mid-latitude observation covariance, region 3



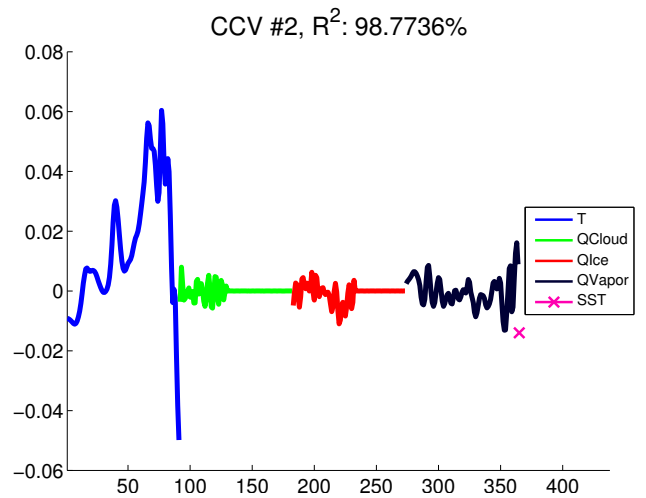
(a) CCV 1, Tropical



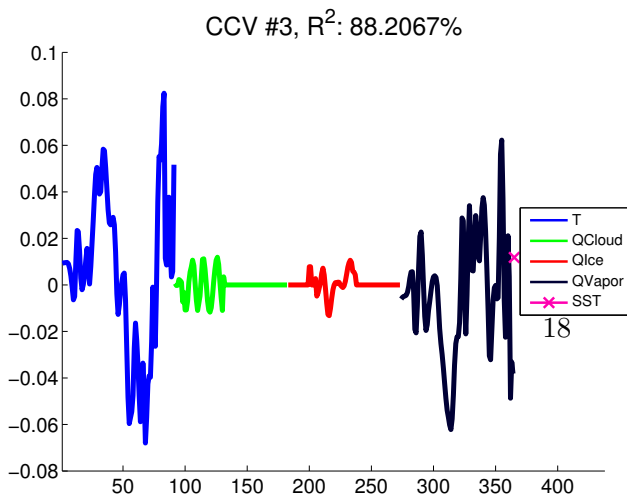
(b) CCV 1, Mid-Lat



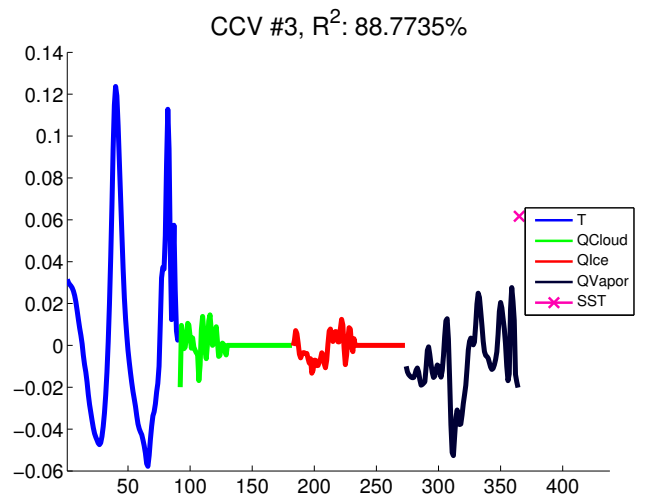
(c) CCV 2, Tropical



(d) CCV 2, Mid-Lat

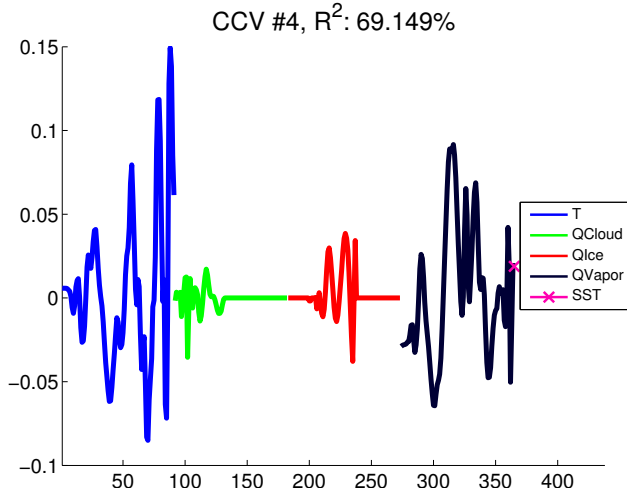


(e) CCV 3, Tropical

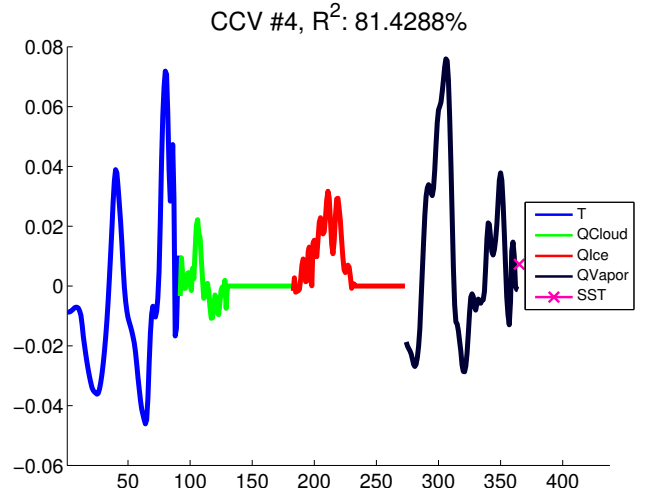


(f) CCV 3, Mid-Lat

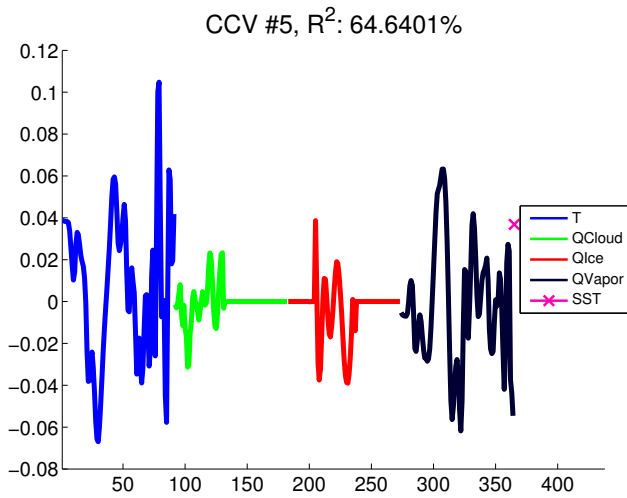
Figure 18: Global CCVs 1-3 comparison, model



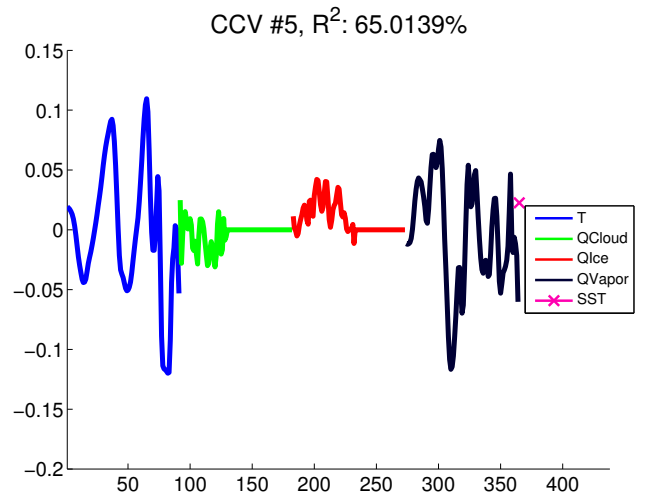
(a) CCV 4, Tropical



(b) CCV 4, Mid-Lat

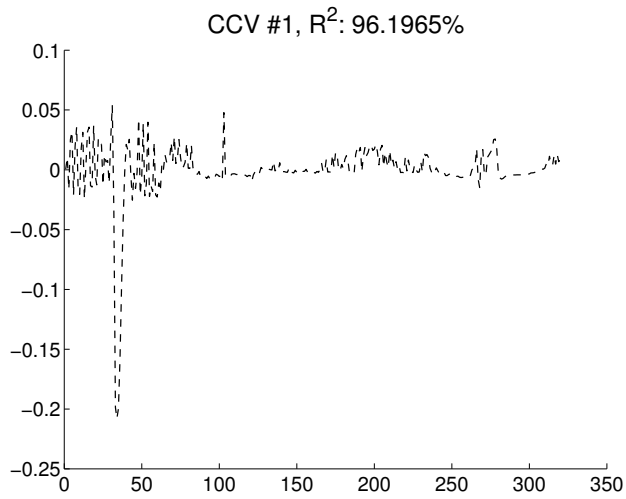


(c) CCV 5, Tropical

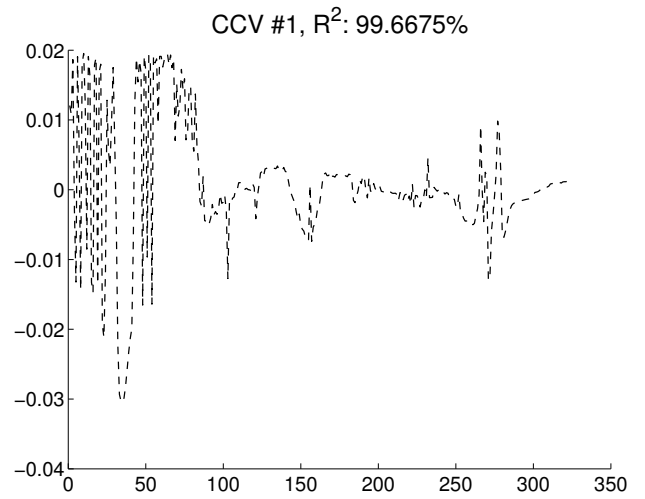


(d) CCV 5, Mid-Lat

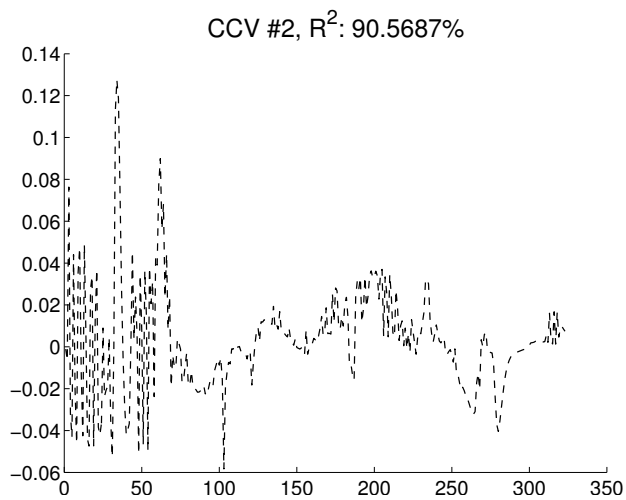
Figure 19: Global CCVs 4–5 comparison, model



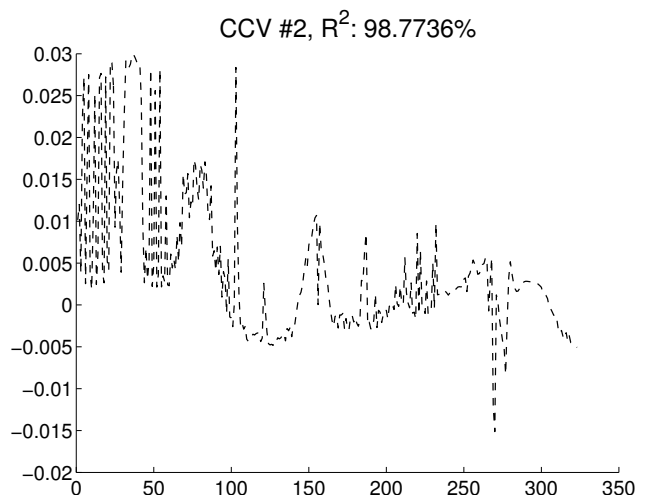
(a) CCV 1, Tropical



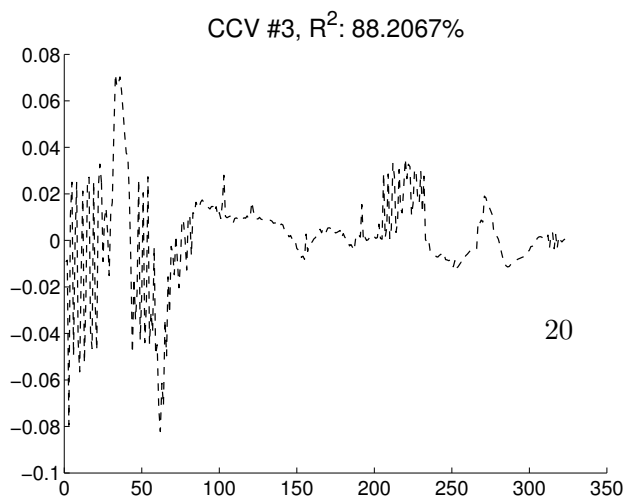
(b) CCV 1, Mid-Lat



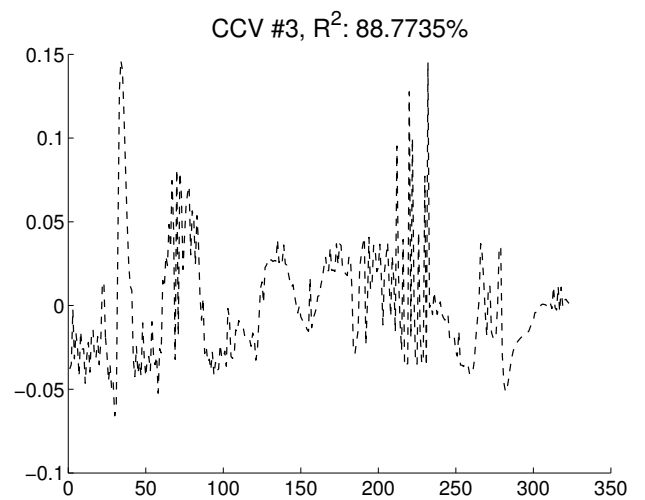
(c) CCV 2, Tropical



(d) CCV 2, Mid-Lat

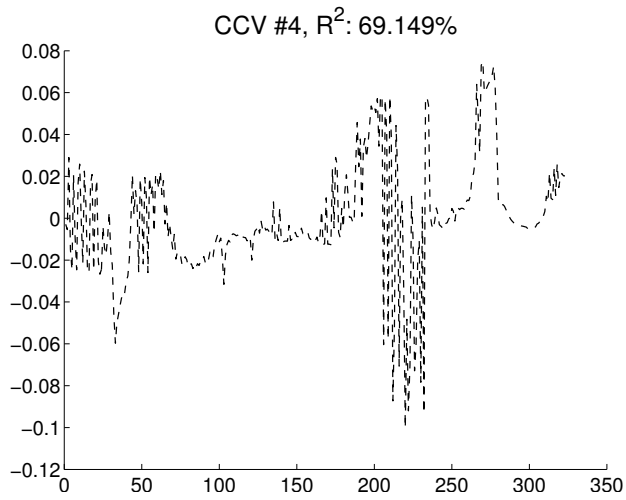


(e) CCV 3, Tropical

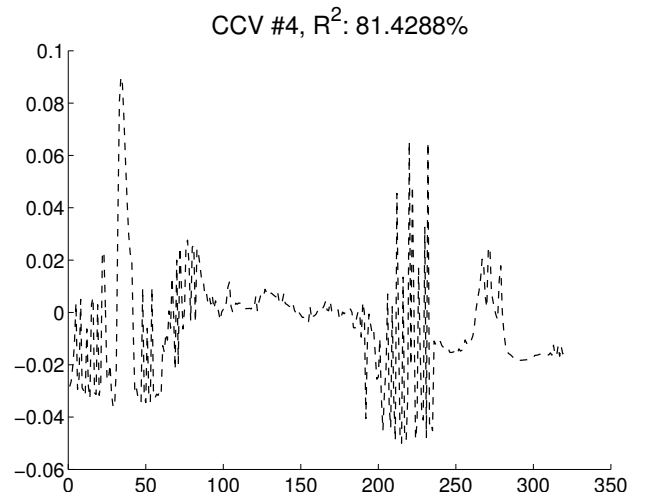


(f) CCV 3, Mid-Lat

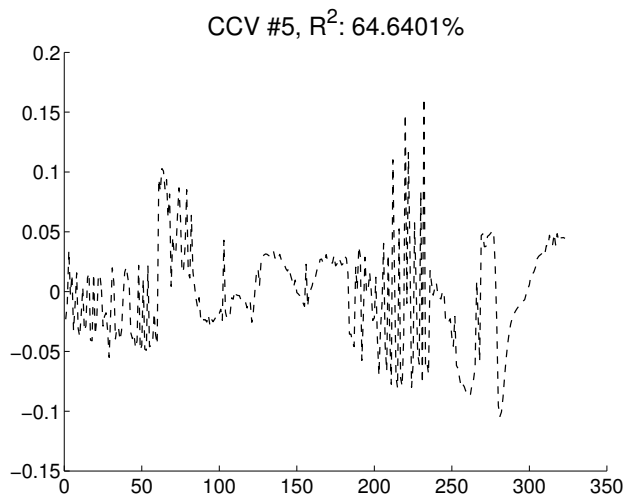
Figure 20: Global CCVs 1–3 comparison, observation



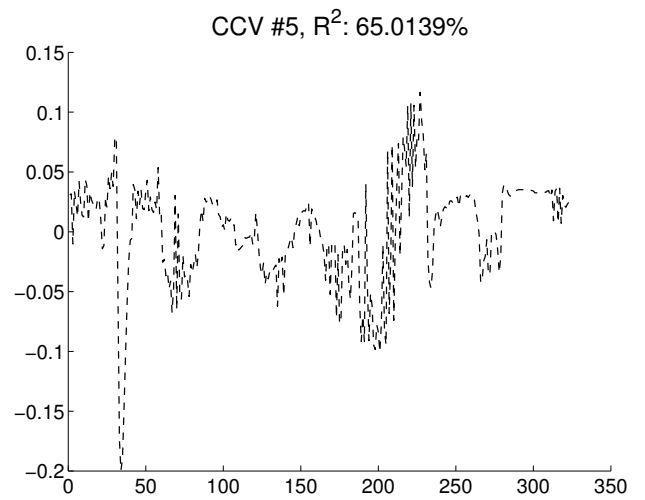
(a) CCV 4, Tropical



(b) CCV 4, Mid-Lat

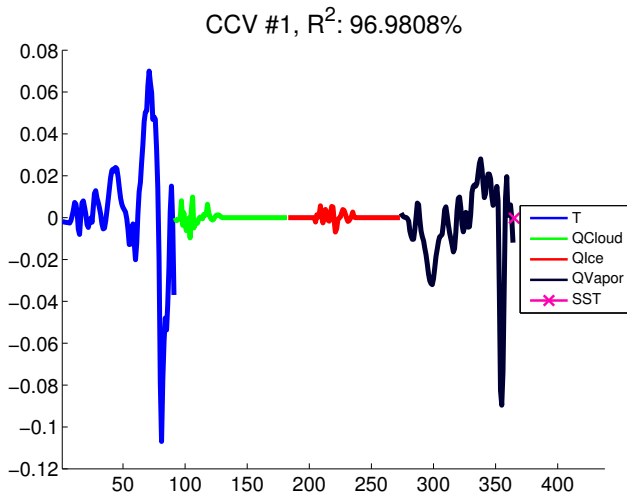


(c) CCV 5, Tropical

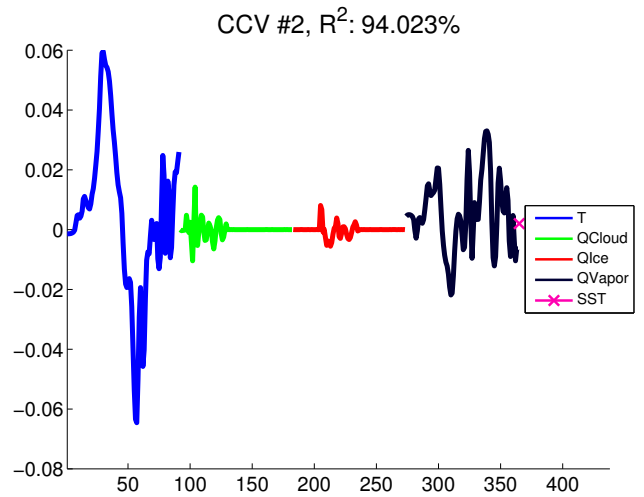


(d) CCV 5, Mid-Lat

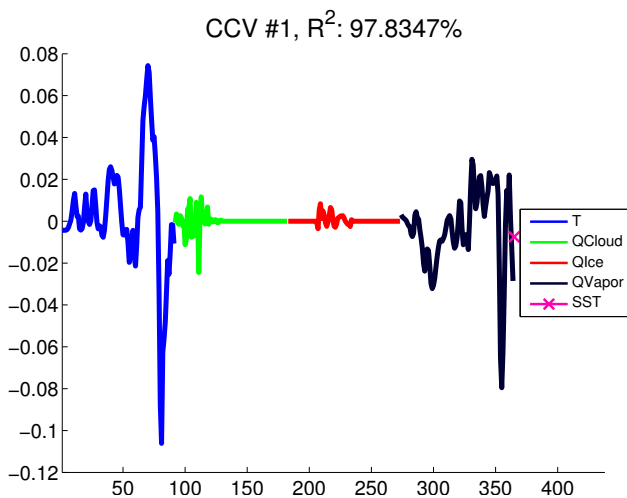
Figure 21: Global CCVs 4–5 comparison, observation



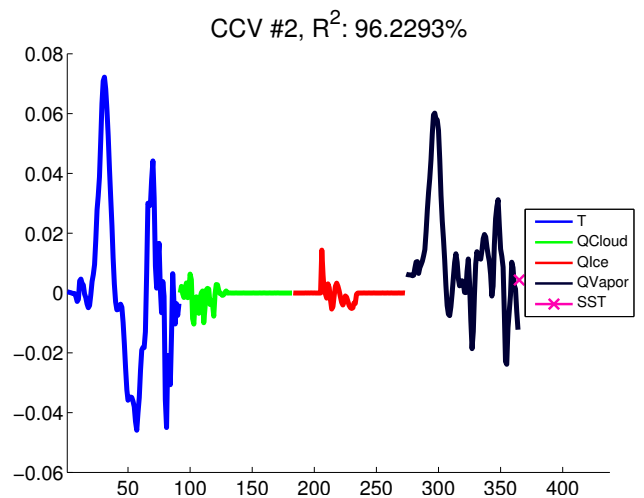
(a) CCV 1, Tropical Region 1



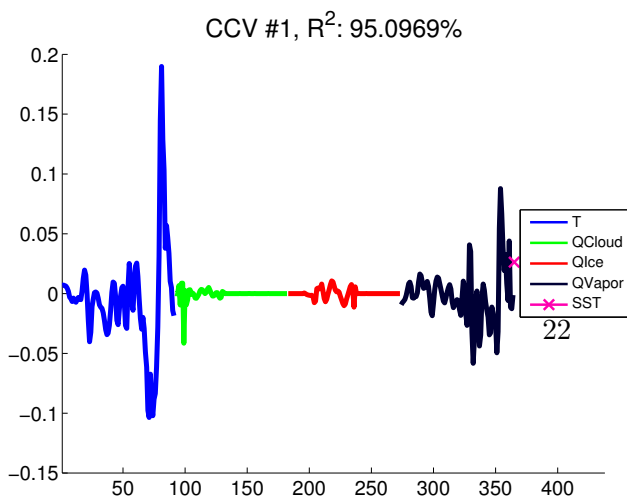
(b) CCV 2, Tropical Region 1



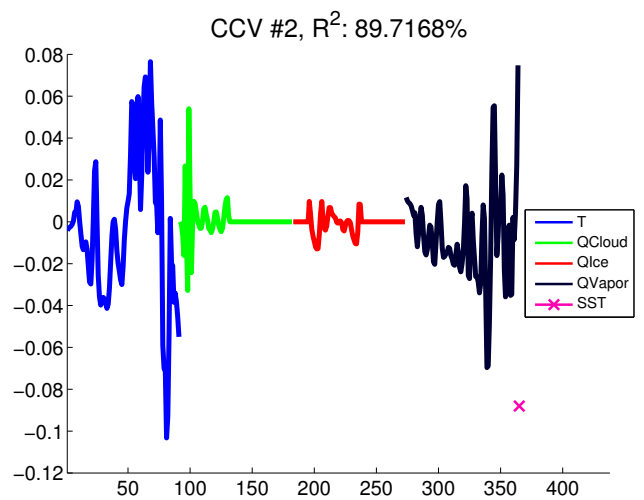
(c) CCV 1, Tropical Region 2



(d) CCV 2, Tropical Region 2

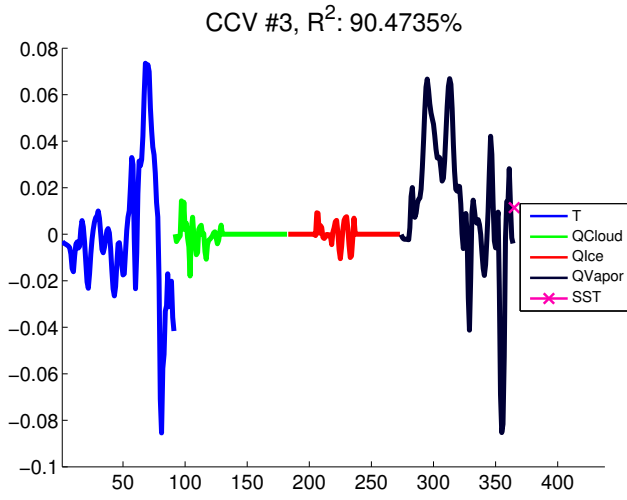


(e) CCV 1, Tropical Region 3

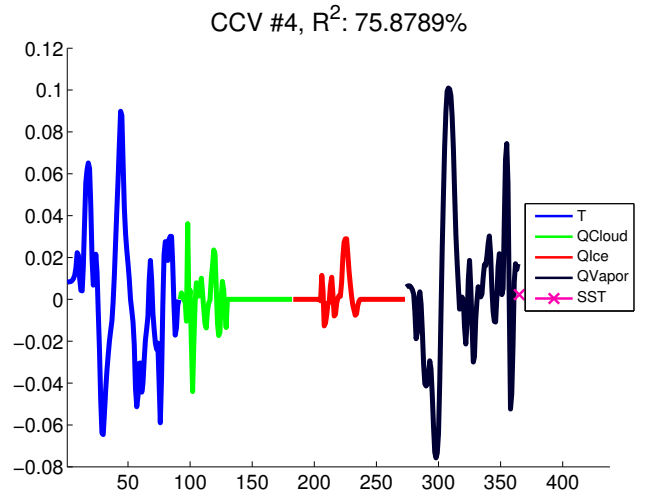


(f) CCV 2, Tropical Region 3

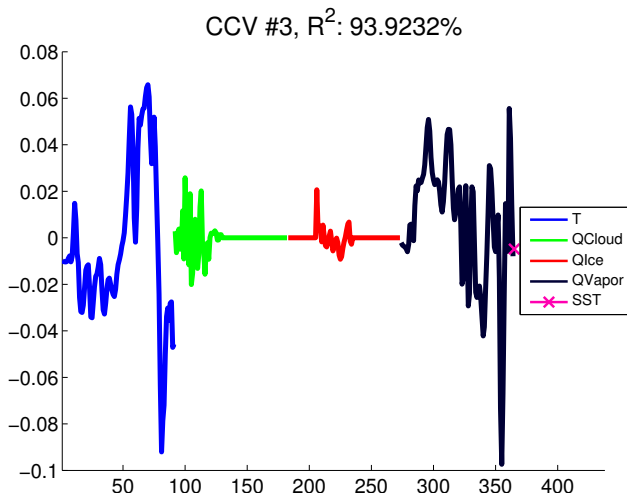
Figure 22: Regional tropical CCVs 1-2 comparison, model



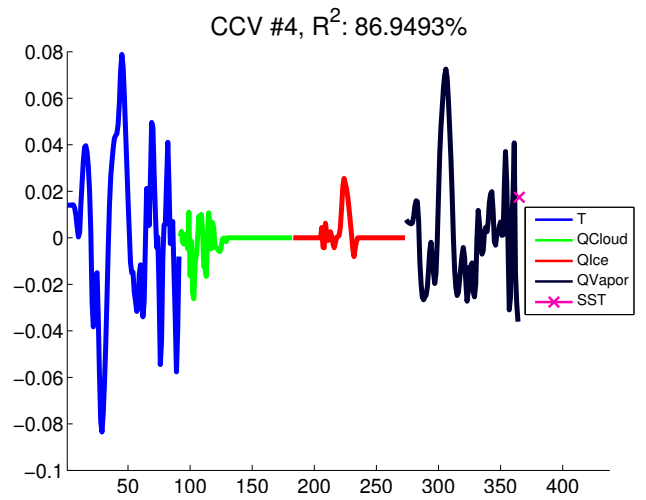
(a) CCV 3, Tropical Region 1



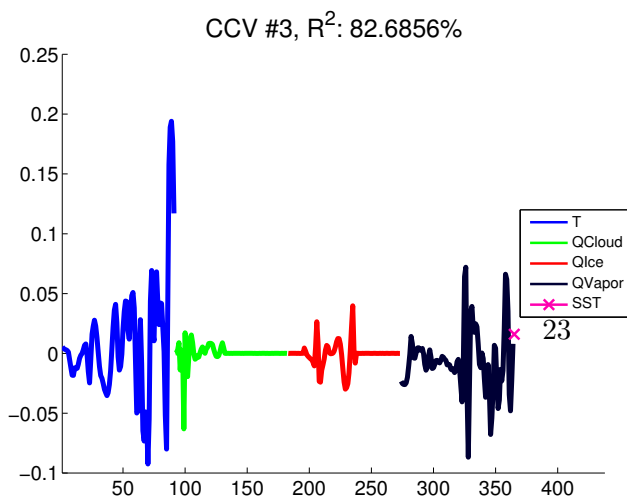
(b) CCV 4, Tropical Region 1



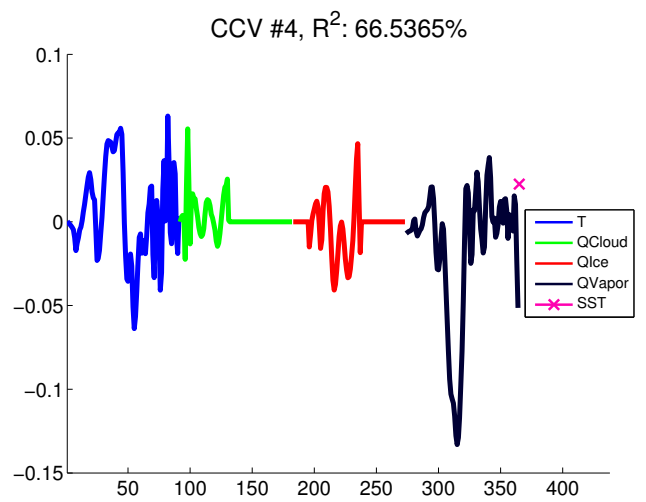
(c) CCV 3, Tropical Region 2



(d) CCV 4, Tropical Region 2

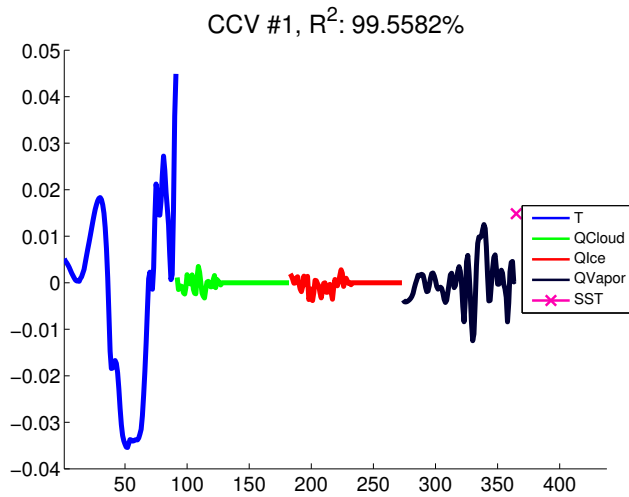


(e) CCV 3, Tropical Region 3

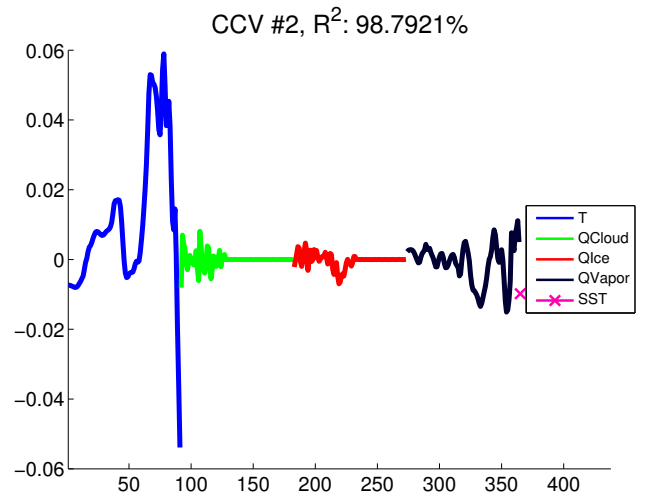


(f) CCV 4, Tropical Region 3

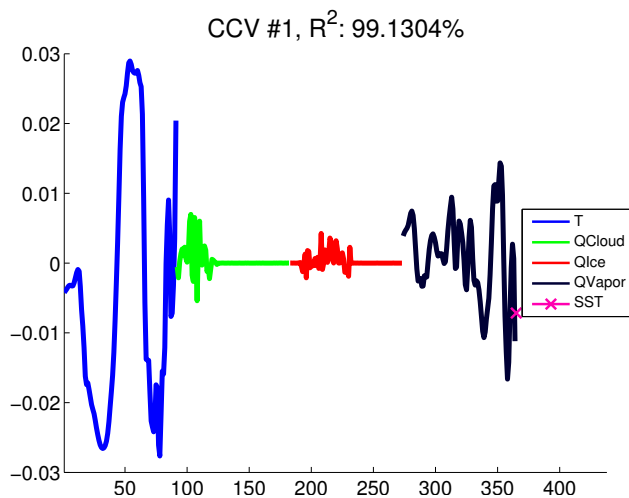
Figure 23: Regional tropical mid-Lat CCVs 3-4 comparison, model



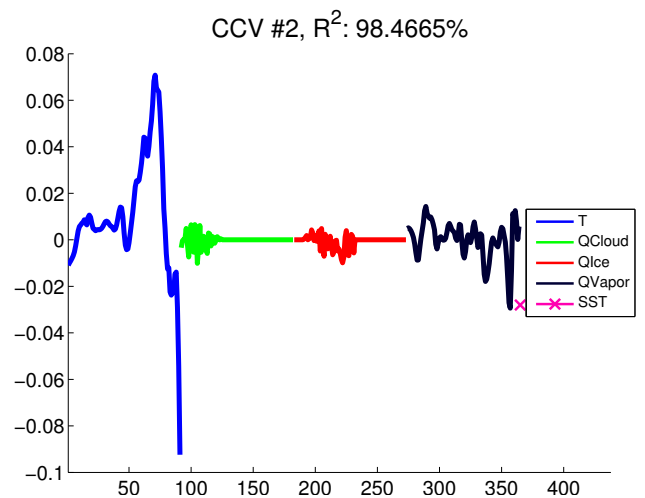
(a) CCV 1, Mid-Lat Region 1



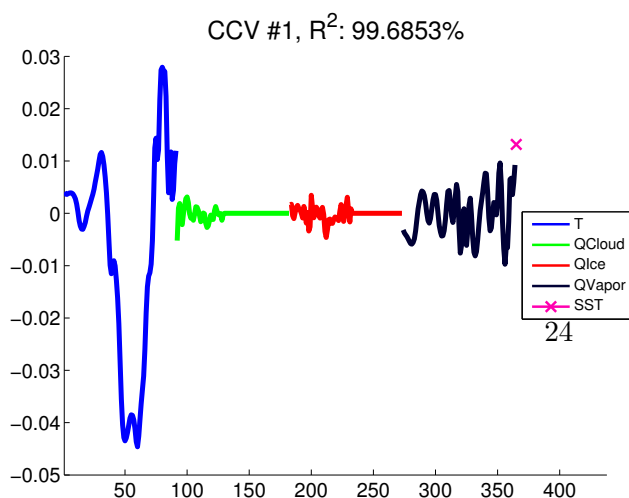
(b) CCV 2, Mid-Lat Region 1



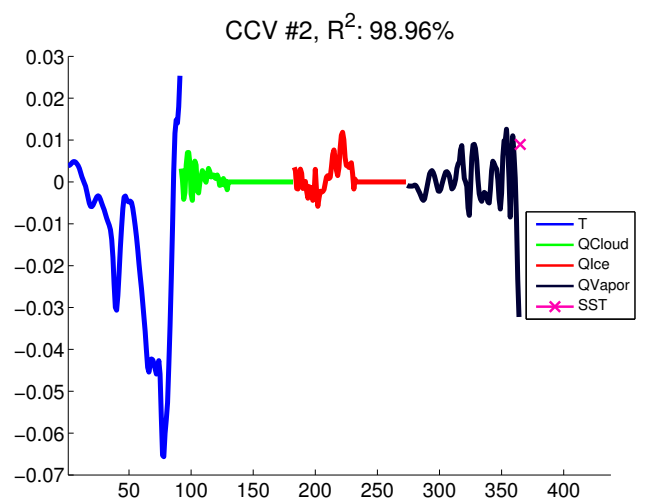
(c) CCV 1, Mid-Lat Region 2



(d) CCV 2, Mid-Lat Region 2

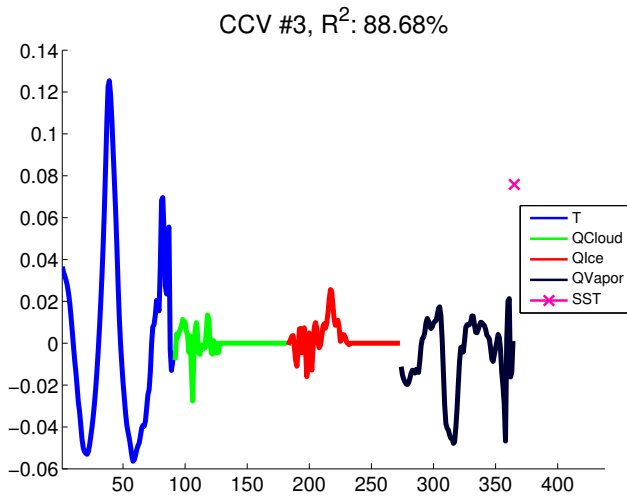


(e) CCV 1, Mid-Lat Region 3

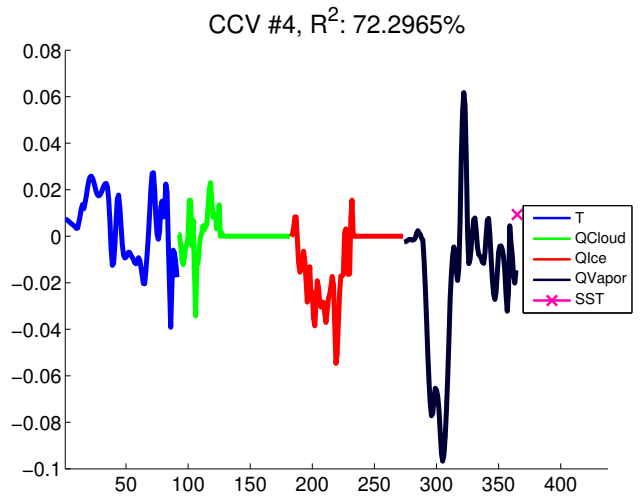


(f) CCV 2, Mid-Lat Region 3

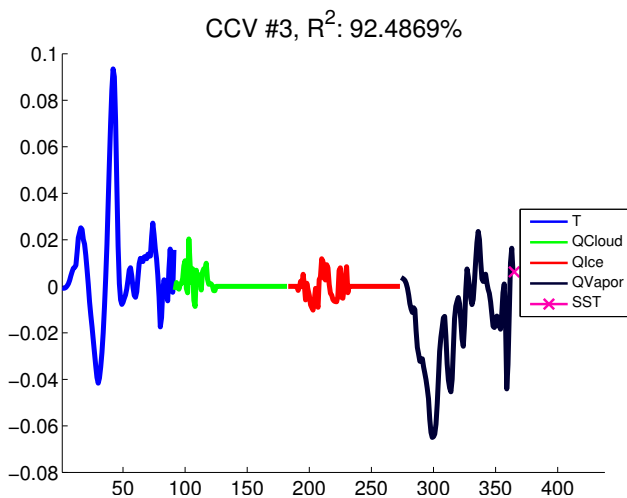
Figure 24: Regional mid-Lat CCVs 1–2 comparison, model



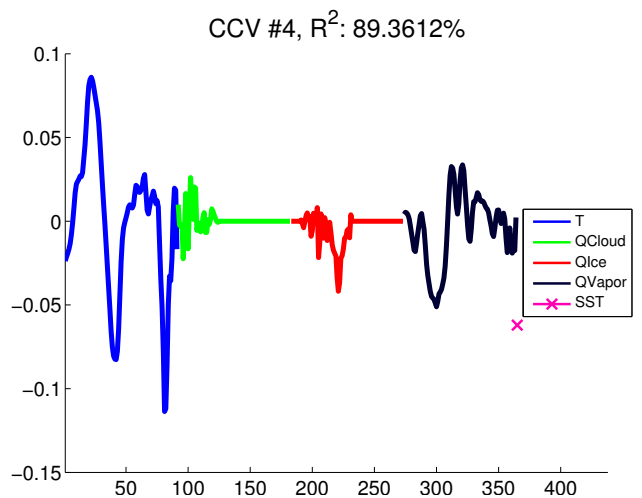
(a) CCV 3, Mid-Lat Region 1



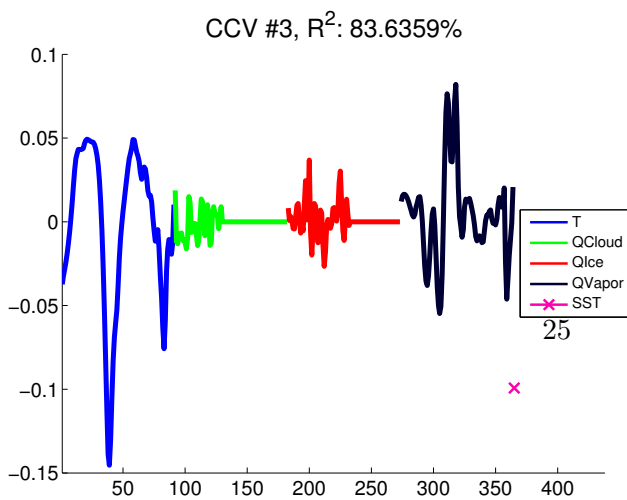
(b) CCV 4, Mid-Lat Region 1



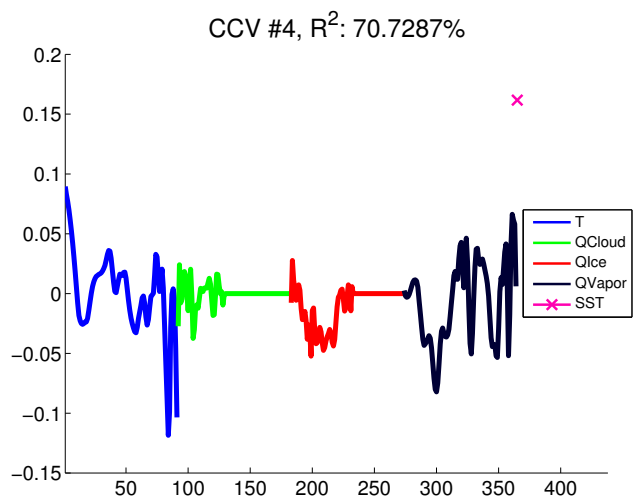
(c) CCV 3, Mid-Lat Region 2



(d) CCV 4, Mid-Lat Region 2

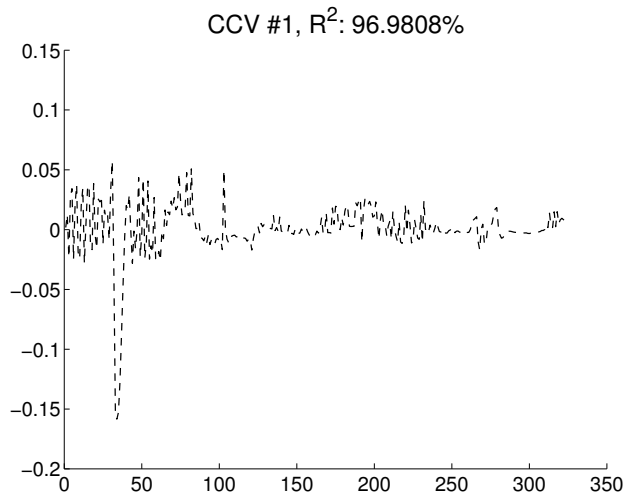


(e) CCV 3, Mid-Lat Region 3

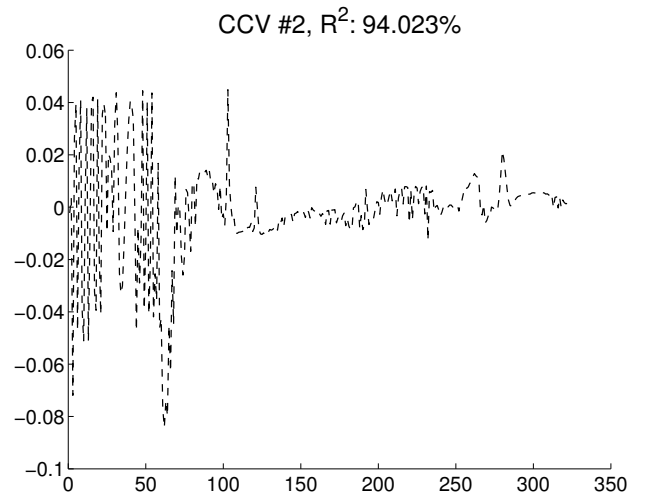


(f) CCV 4, Mid-Lat Region 3

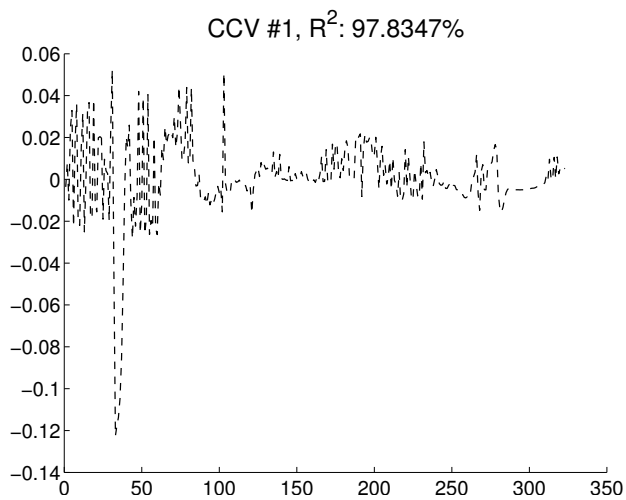
Figure 25: Regional mid-Lat CCVs 3-4 comparison, model



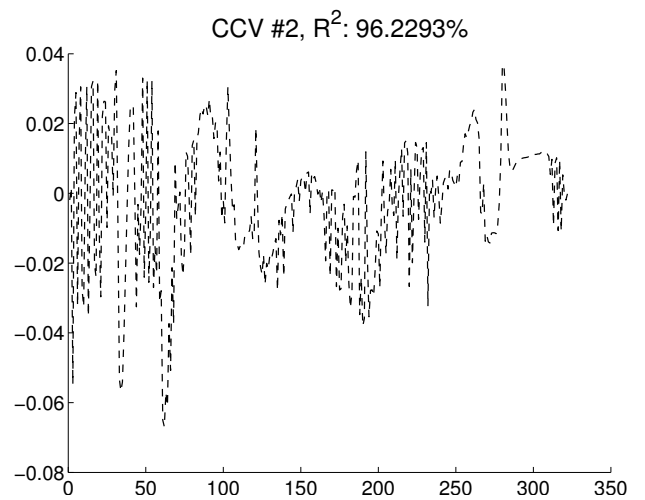
(a) CCV 1, Tropical Region 1



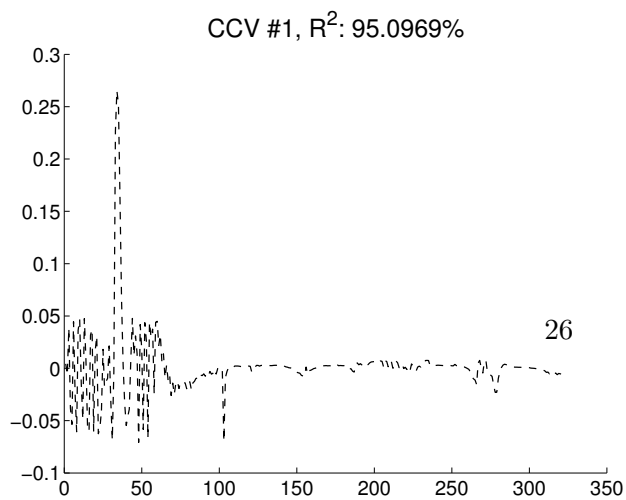
(b) CCV 2, Tropical Region 1



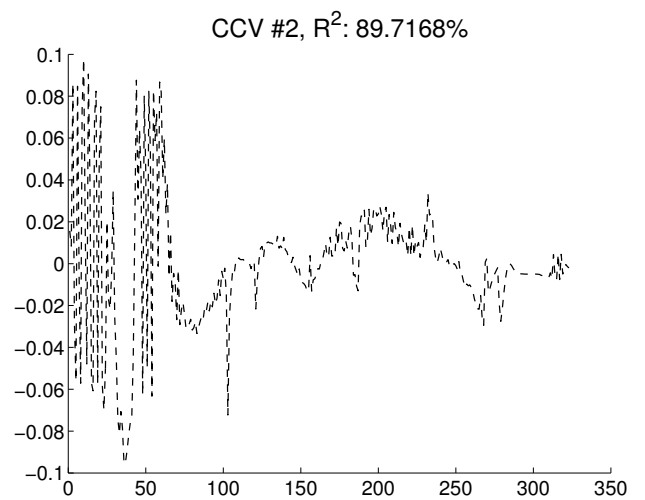
(c) CCV 1, Tropical Region 2



(d) CCV 2, Tropical Region 2

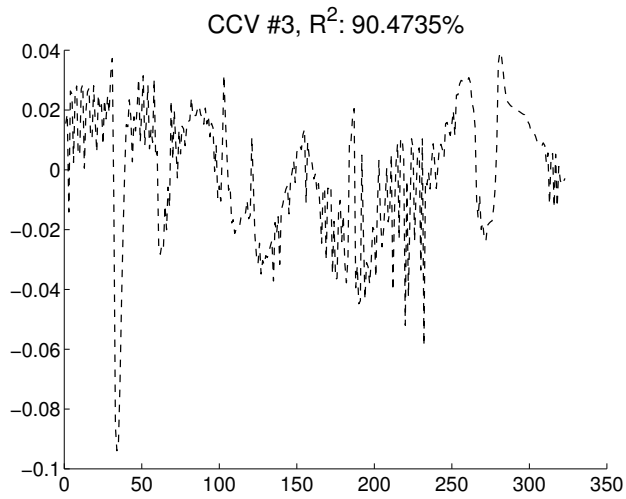


(e) CCV 1, Tropical Region 3

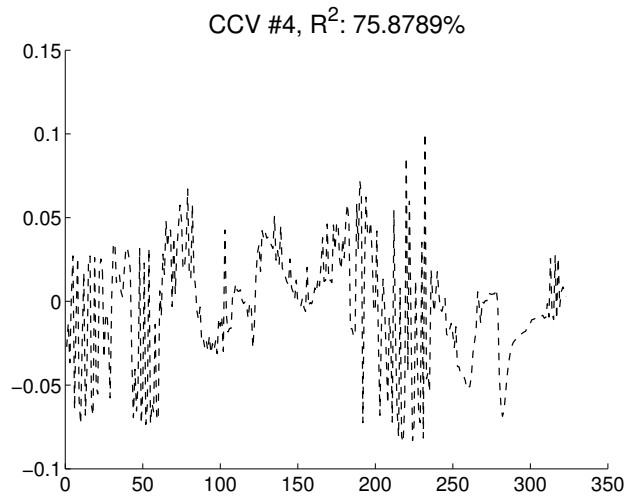


(f) CCV 2, Tropical Region 3

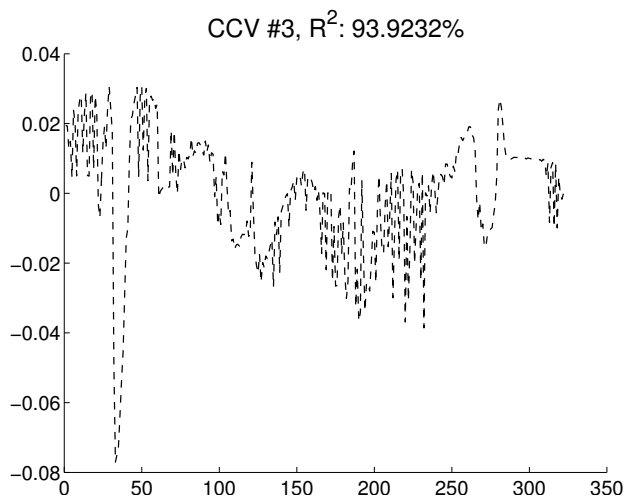
Figure 26: Regional tropical CCVs 1-2 comparison, observation



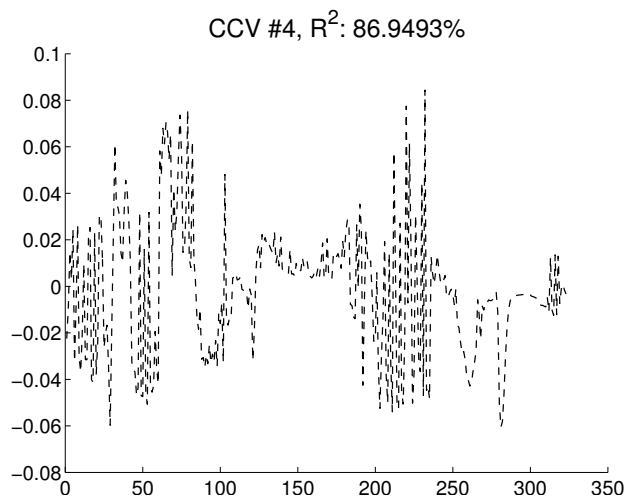
(a) CCV 3, Tropical Region 1



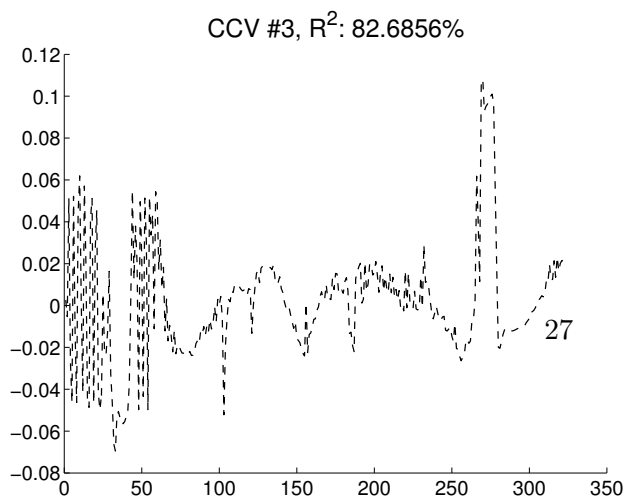
(b) CCV 4, Tropical Region 1



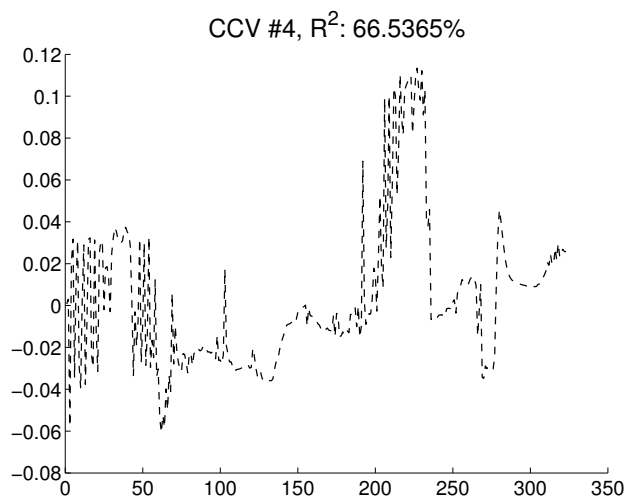
(c) CCV 3, Tropical Region 2



(d) CCV 4, Tropical Region 2

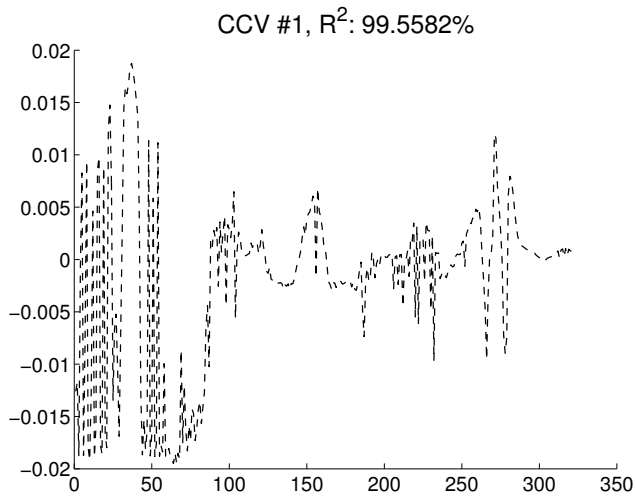


(e) CCV 3, Tropical Region 3

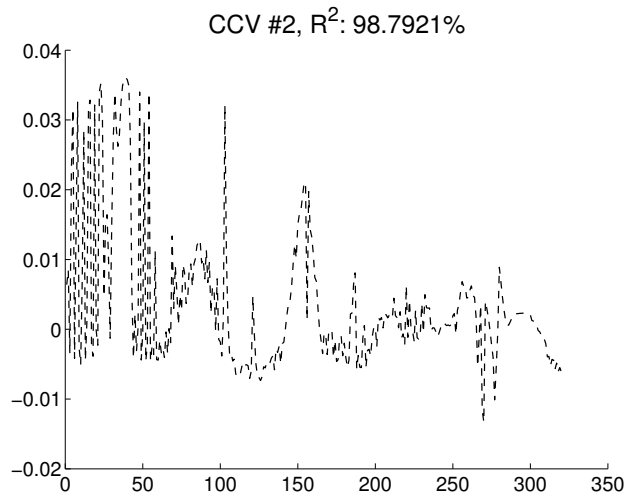


(f) CCV 4, Tropical Region 3

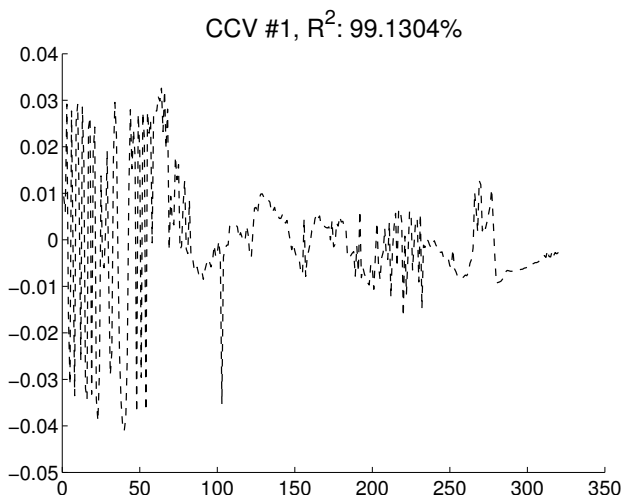
Figure 27: Regional Tropical CCVs 3-4 comparison, observation



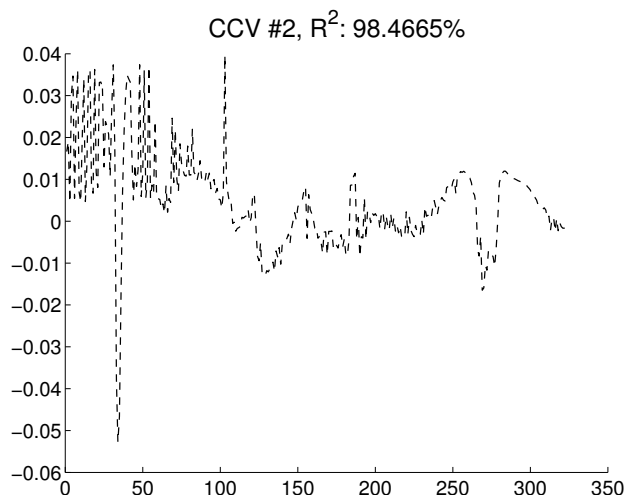
(a) CCV 1, Mid-Lat Region 1



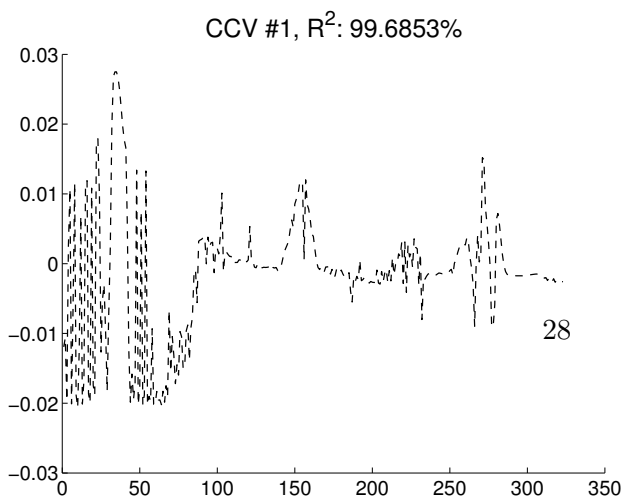
(b) CCV 2, Mid-Lat Region 1



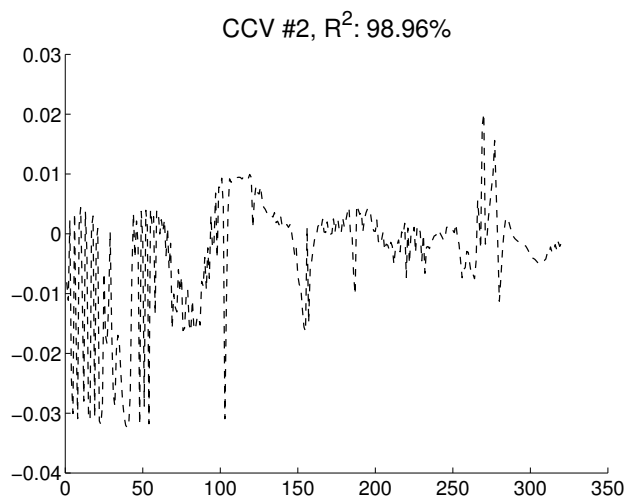
(c) CCV 1, Mid-Lat Region 2



(d) CCV 2, Mid-Lat Region 2

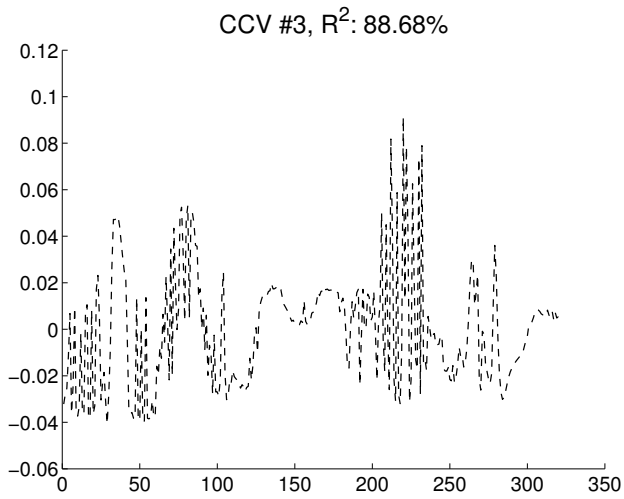


(e) CCV 1, Mid-Lat Region 3

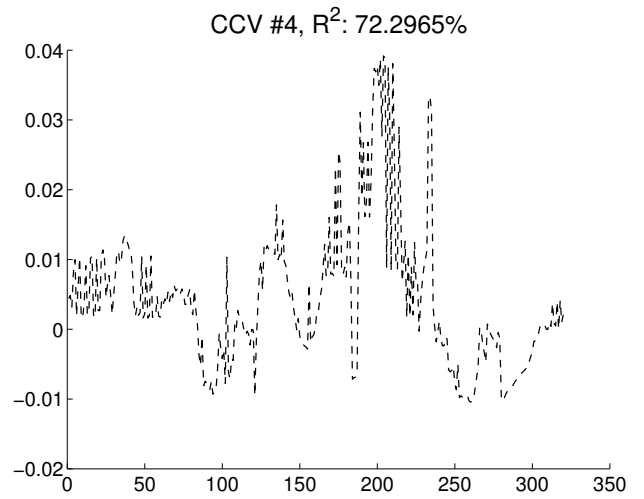


(f) CCV 2, Mid-Lat Region 3

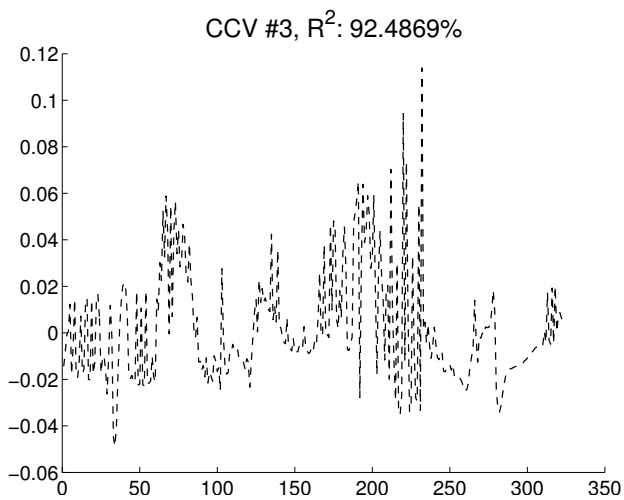
Figure 28: Regional mid-Lat CCVs 1-2 comparison, observation



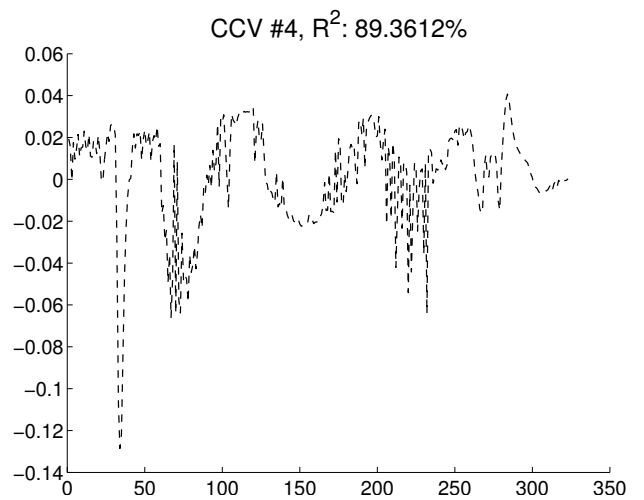
(a) CCV 3, Mid-Lat Region 1



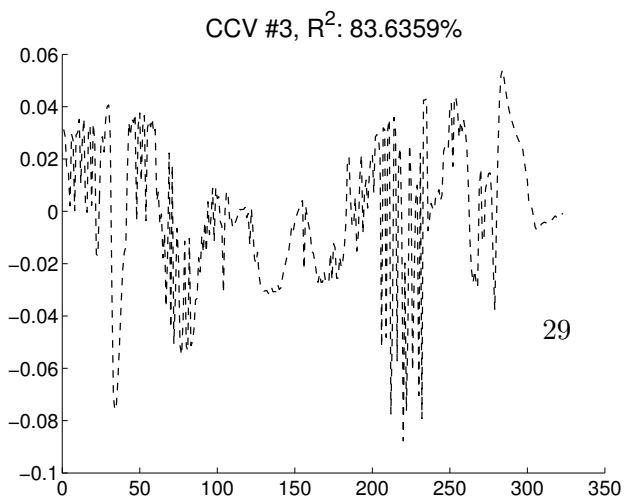
(b) CCV 4, Mid-Lat Region 1



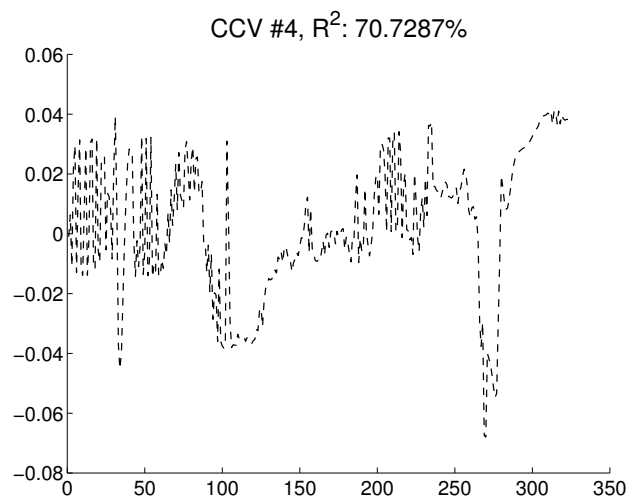
(c) CCV 3, Mid-Lat Region 2



(d) CCV 4, Mid-Lat Region 2

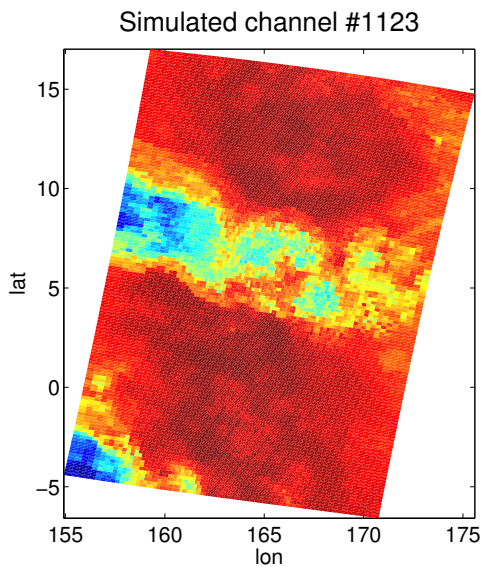


(e) CCV 3, Mid-Lat Region 3

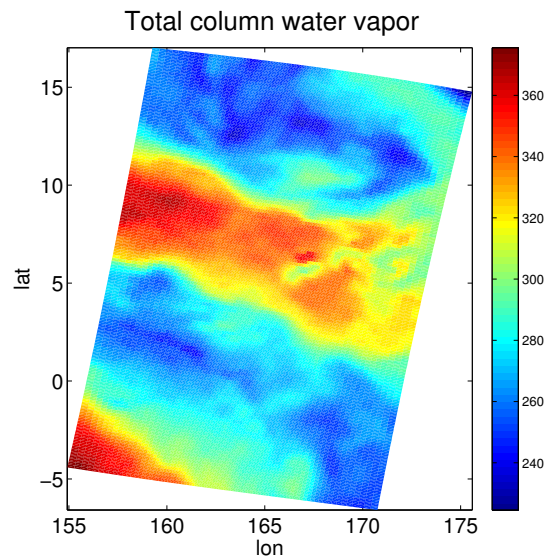


(f) CCV 4, Mid-Lat Region 3

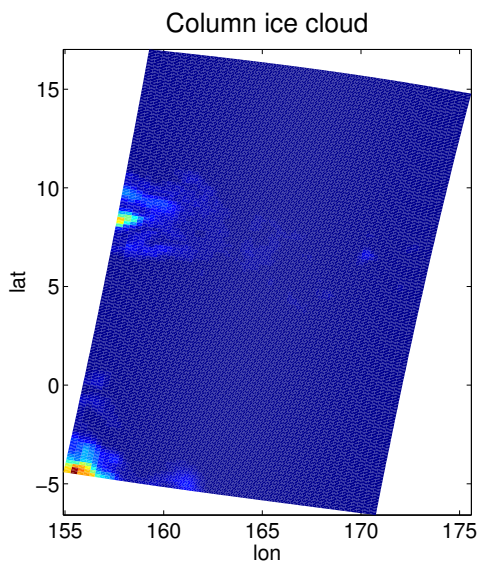
Figure 29: Regional mid-Lat CCVs 3-4 comparison, observation



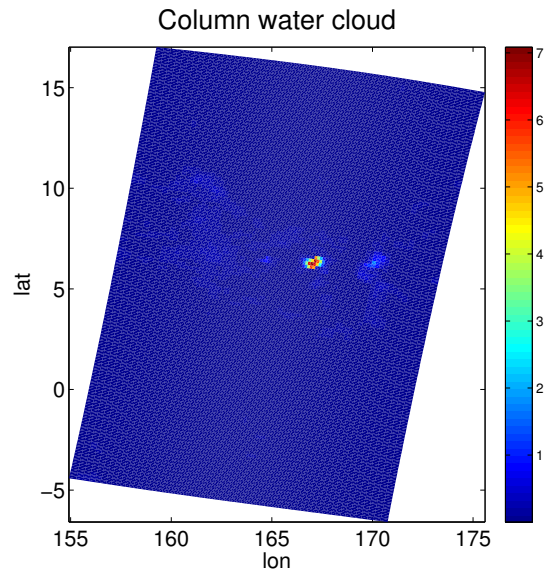
(a) AIRS Channel 1123



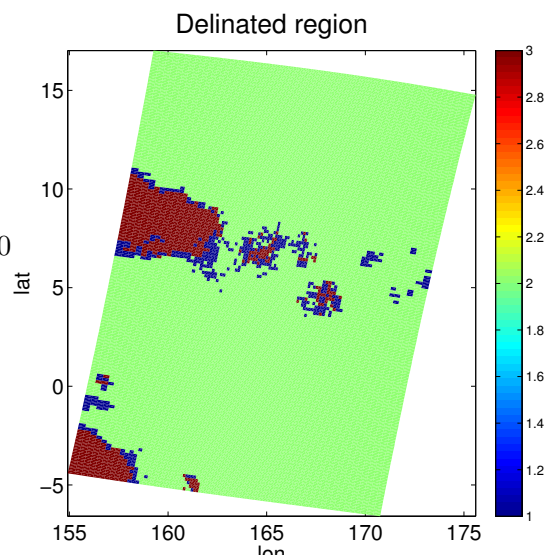
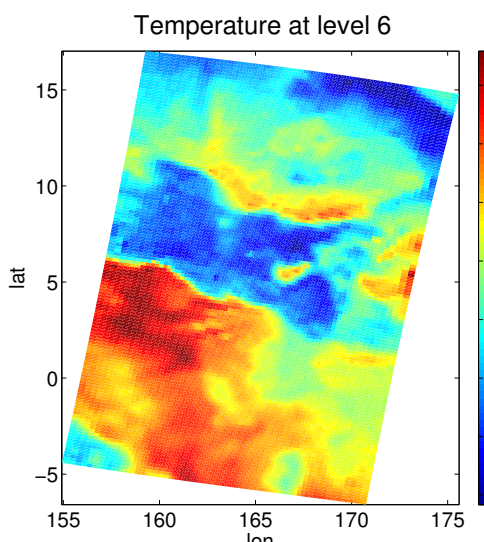
(b) QVapor



(c) QIce



(d) QCloud



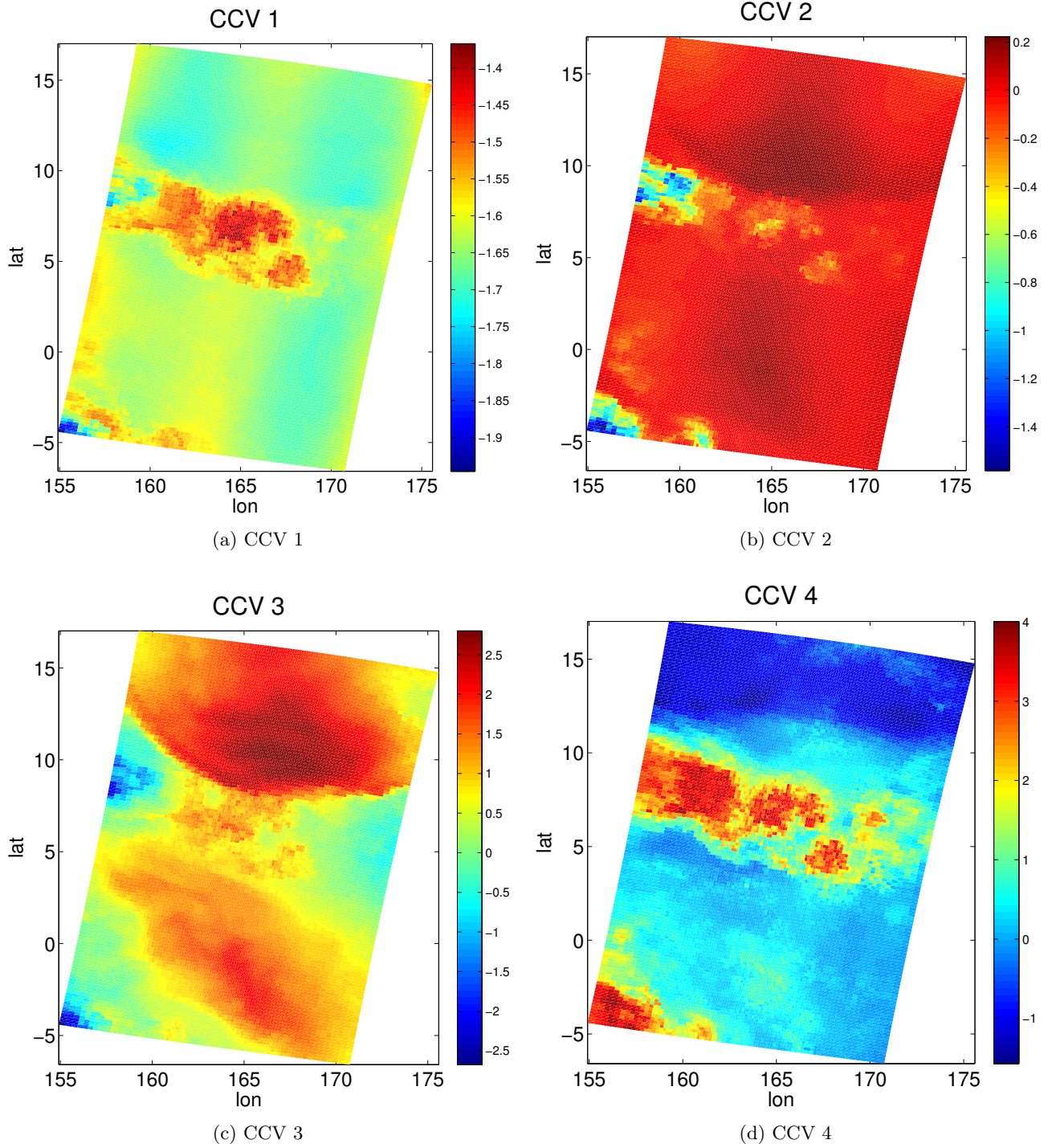


Figure 31: Tropical observation global CCV comparison

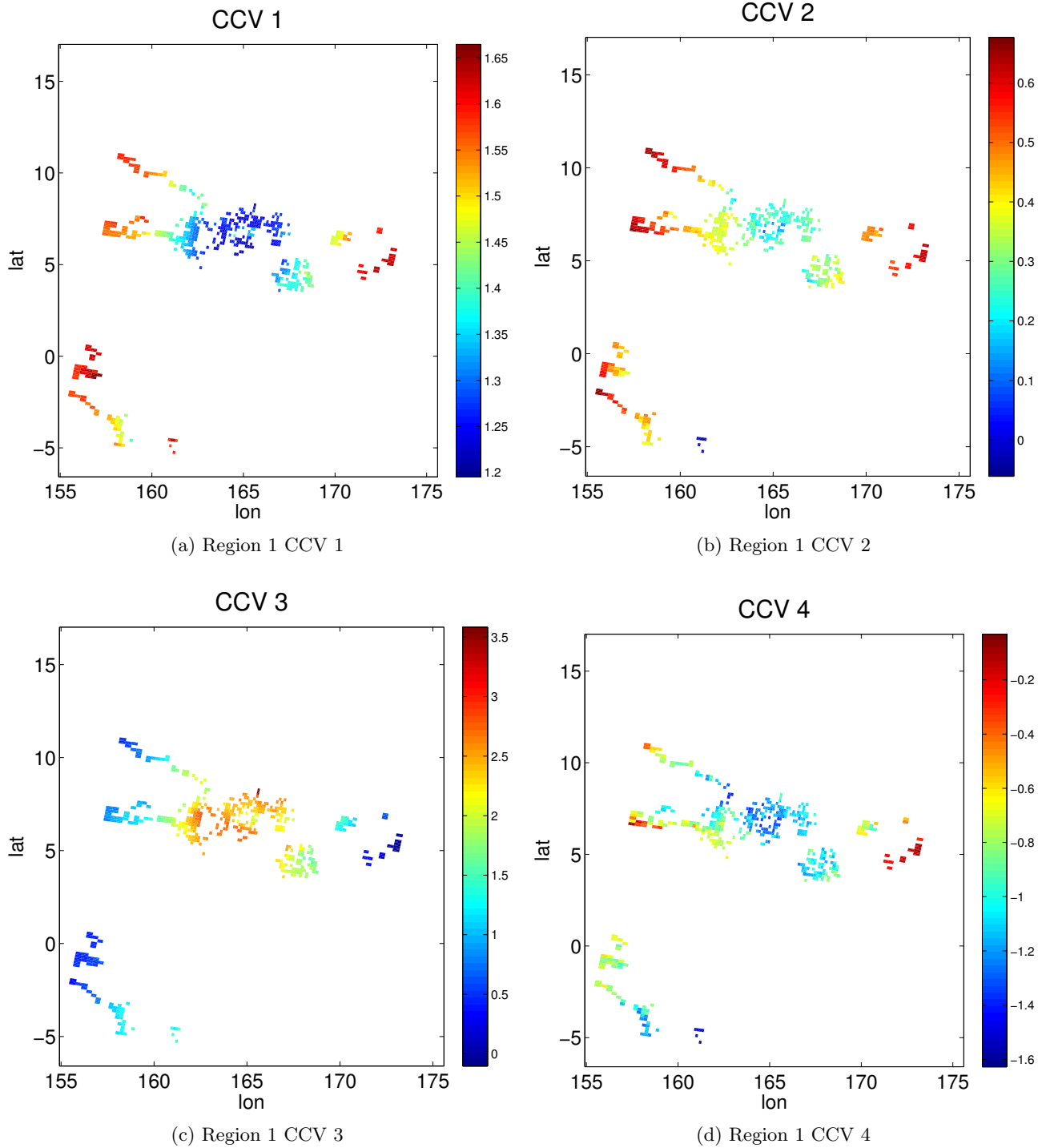


Figure 32: Tropical region 1 CCV comparison

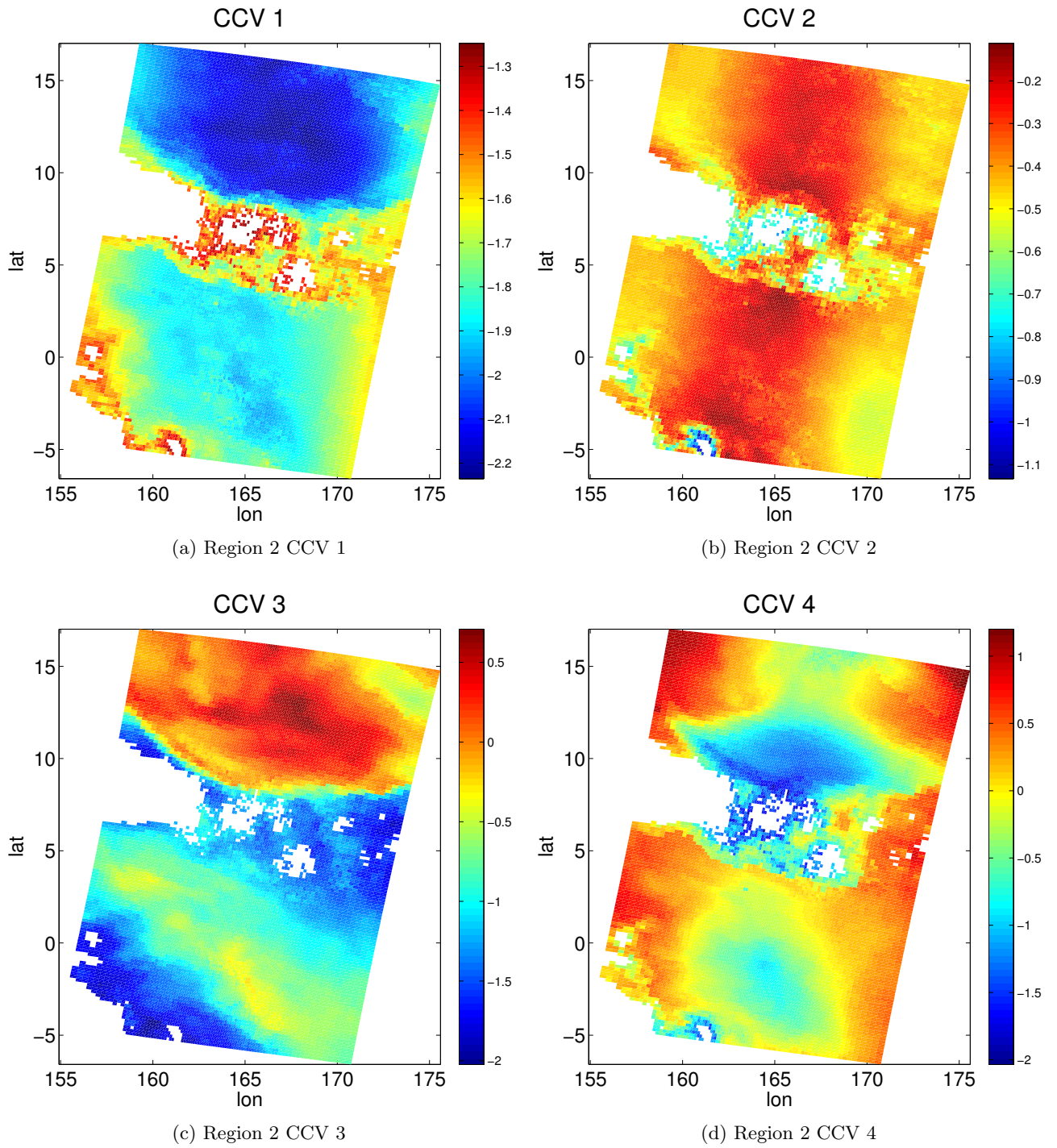


Figure 33: Tropical region 2 CCV comparison

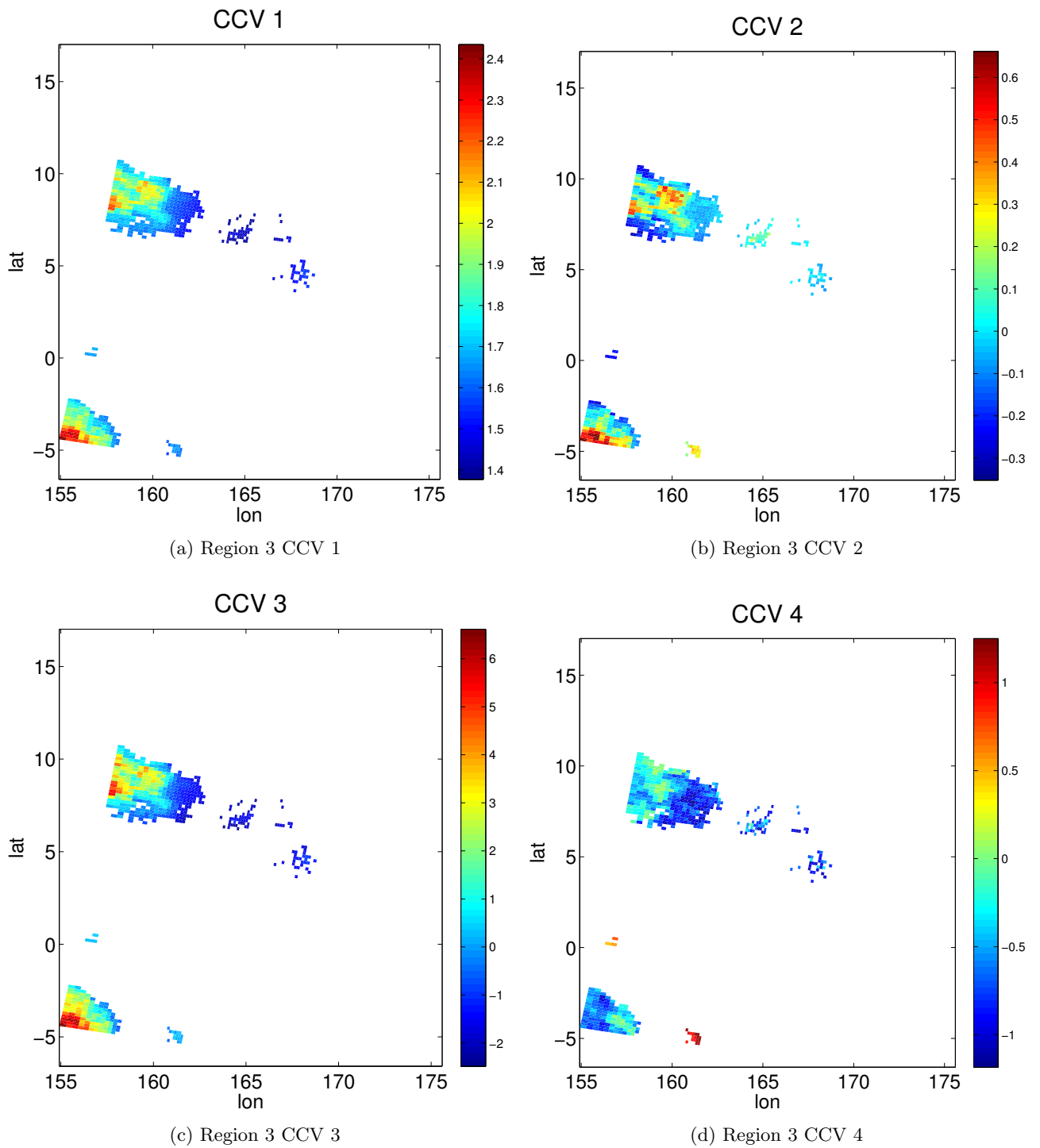


Figure 34: Tropical region 3 CCV comparison

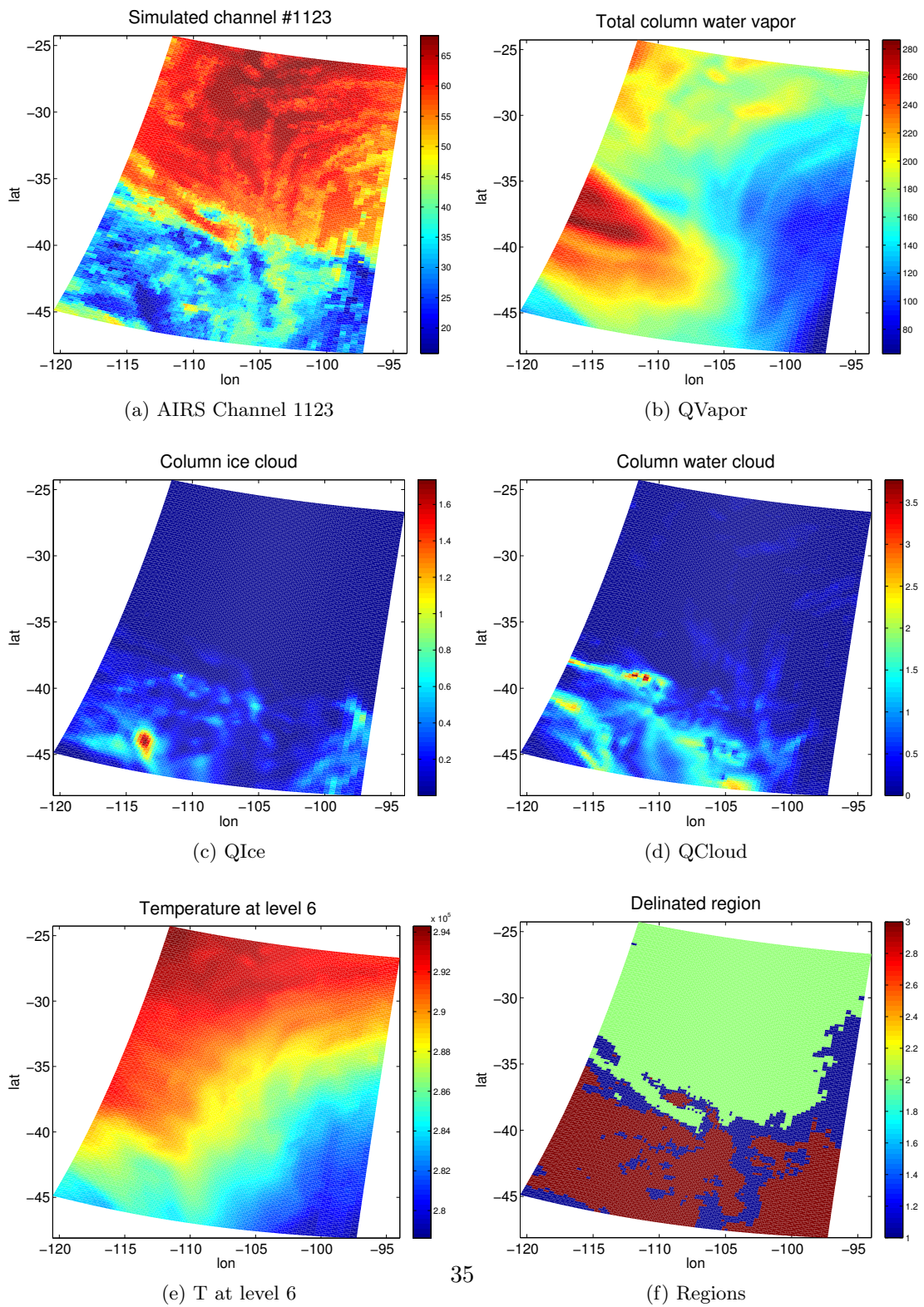


Figure 35: Mid-latitude model fields comparison

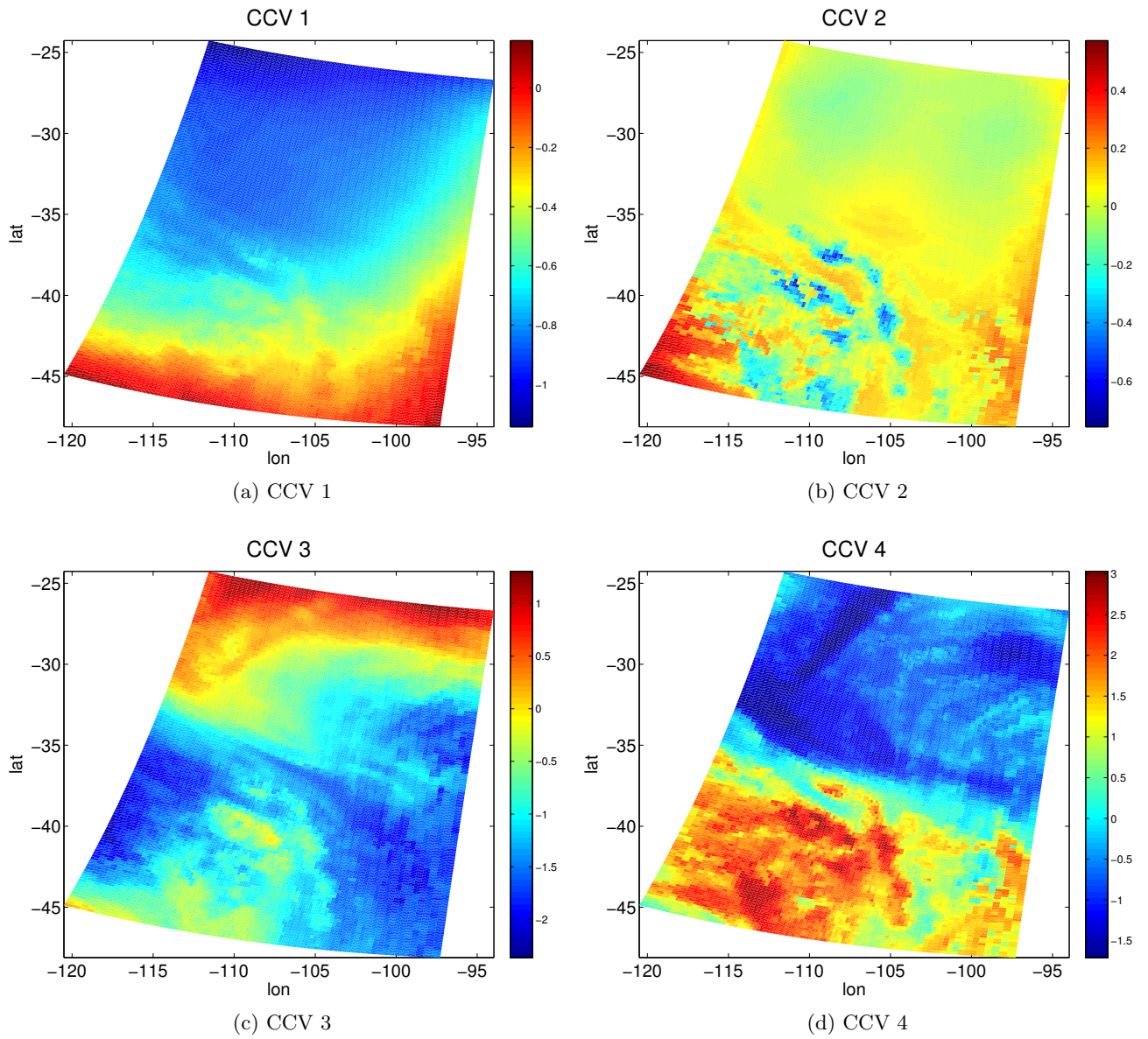


Figure 36: Mid-latitude observation global CCV comparison

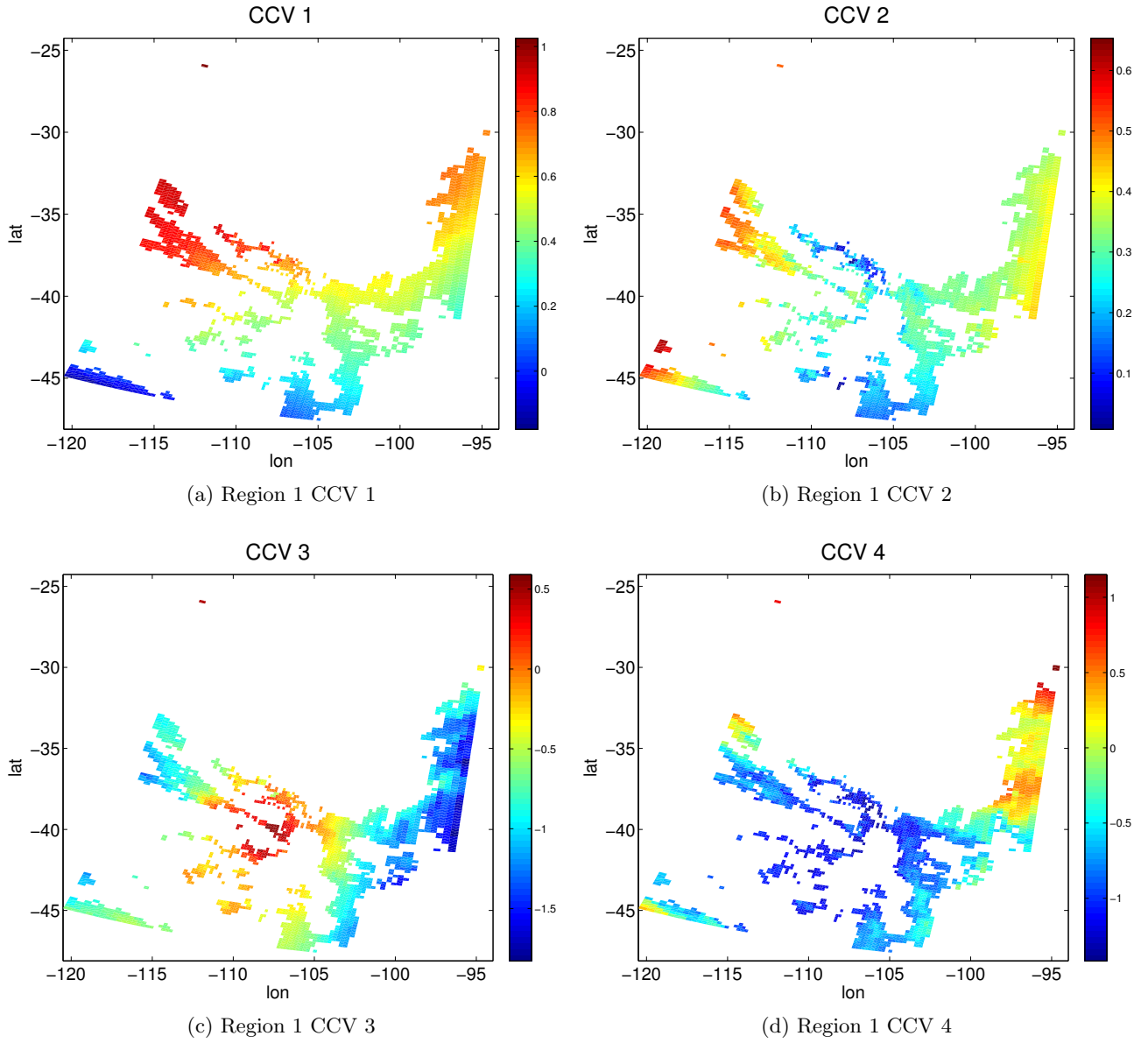


Figure 37: Mid-latitude region 1 CCV comparison

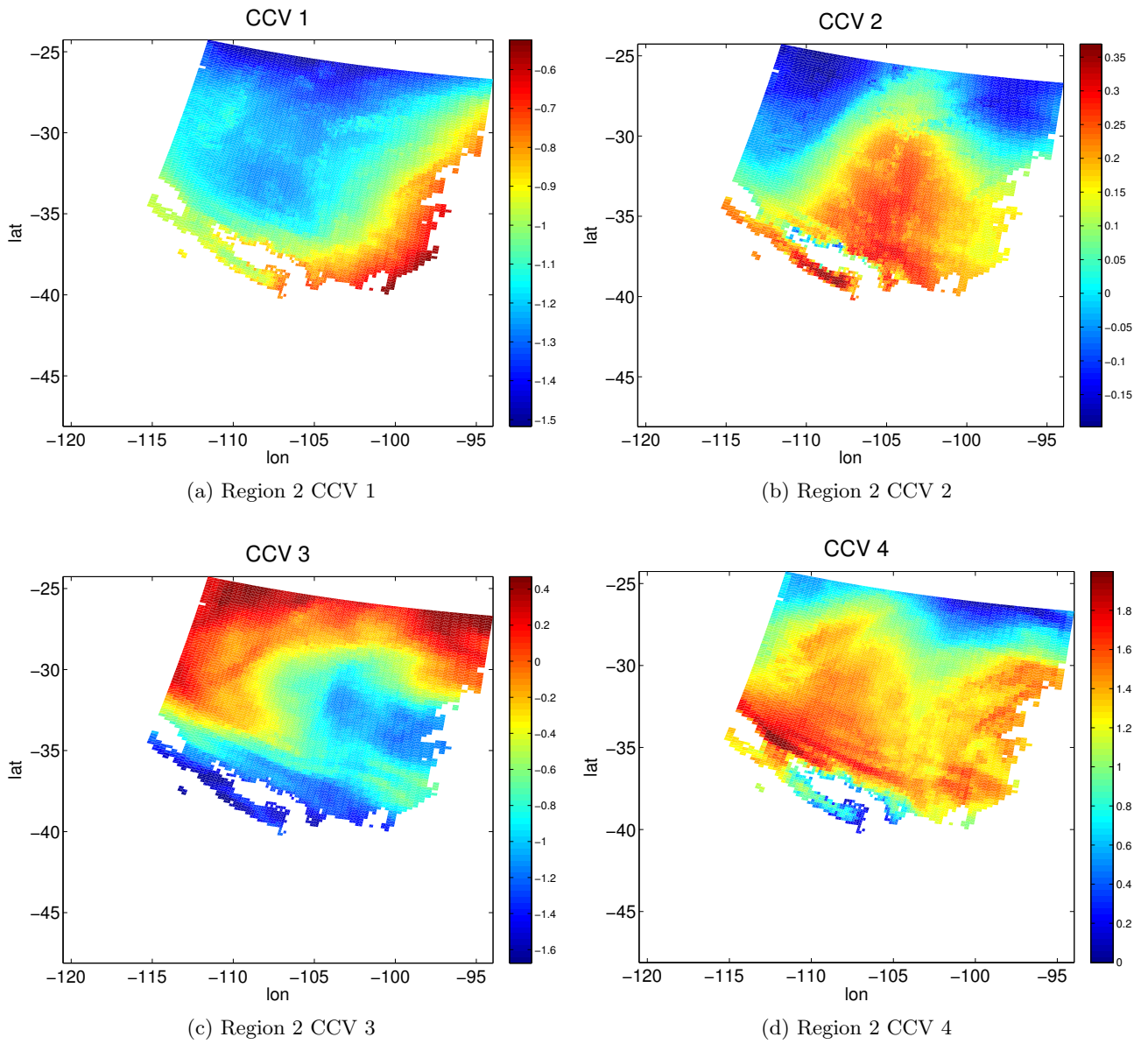


Figure 38: Mid-latitude region 2 CCV comparison

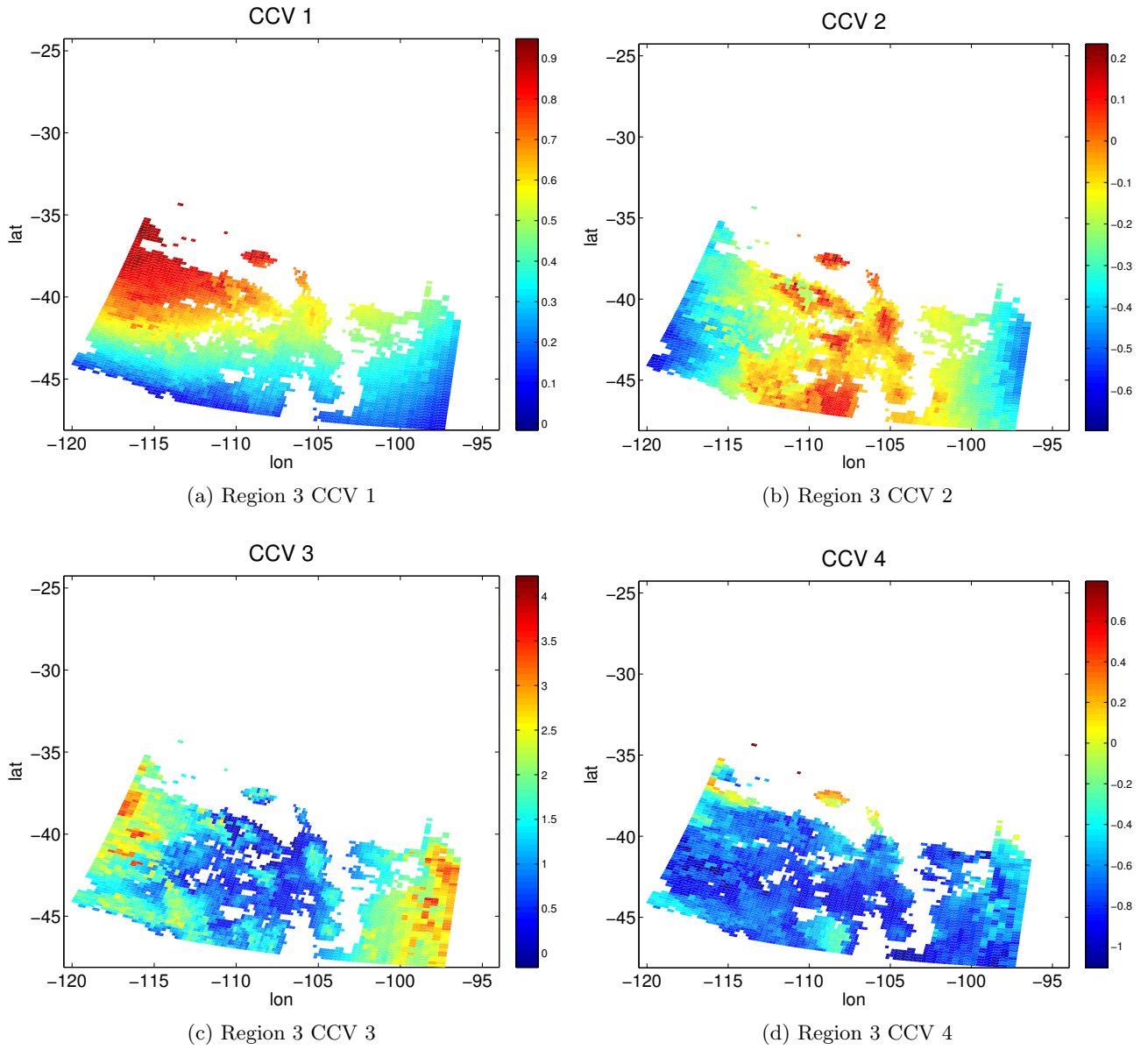


Figure 39: Mid-latitude region 3 CCV comparison