

Centennial trend and decadal-to-interdecadal variability of atmospheric angular momentum in climate model simulations

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Datasets and key definitions

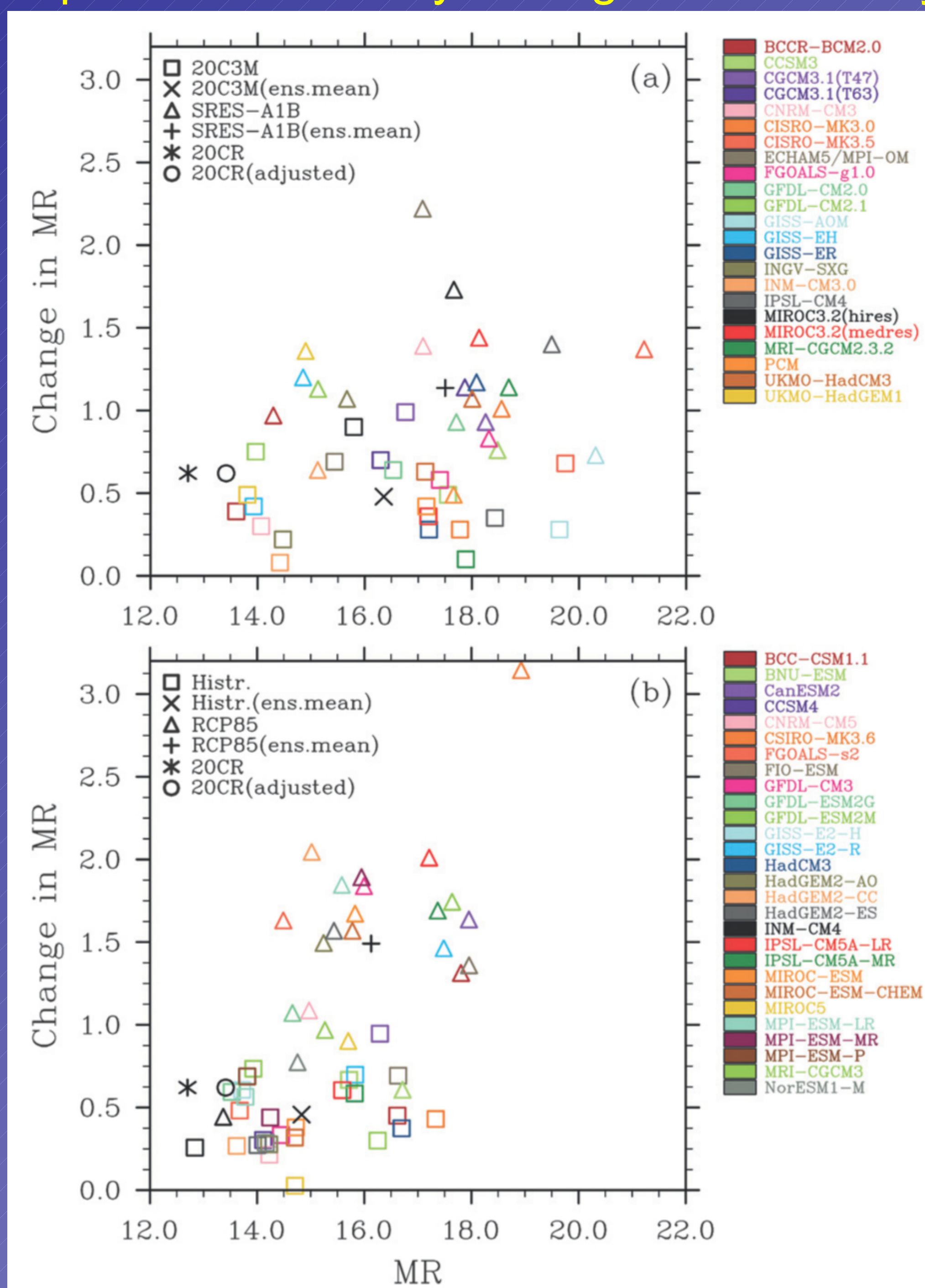
Using global atmospheric angular momentum (AAM) as a climate index, the centennial trend and decadal-to-interdecadal variability in CMIP3 and CMIP5 simulations are compared and validated with reanalysis. For each (20th or 21st) century, the trend is defined as the difference between the means of the first and last 20 yrs of the century. The decadal and interdecadal standard deviation of AAM are estimated from the amplitudes of the 7-15 yr and 16-35 yr bands of its power spectrum, after the removal of the linear trend. The 20th Century Reanalysis (20CR, Compo et al. 2011) is used as the 'observation' for the 20th Century. The climatological mean of 20CR is calibrated with other reanalysis datasets over the post-1979 era.

Climatology vs. trend of relative AAM

(a) CMIP3 (20C3M & SRES A1B)

(b) CMIP5 (Historical & RCP8.5)

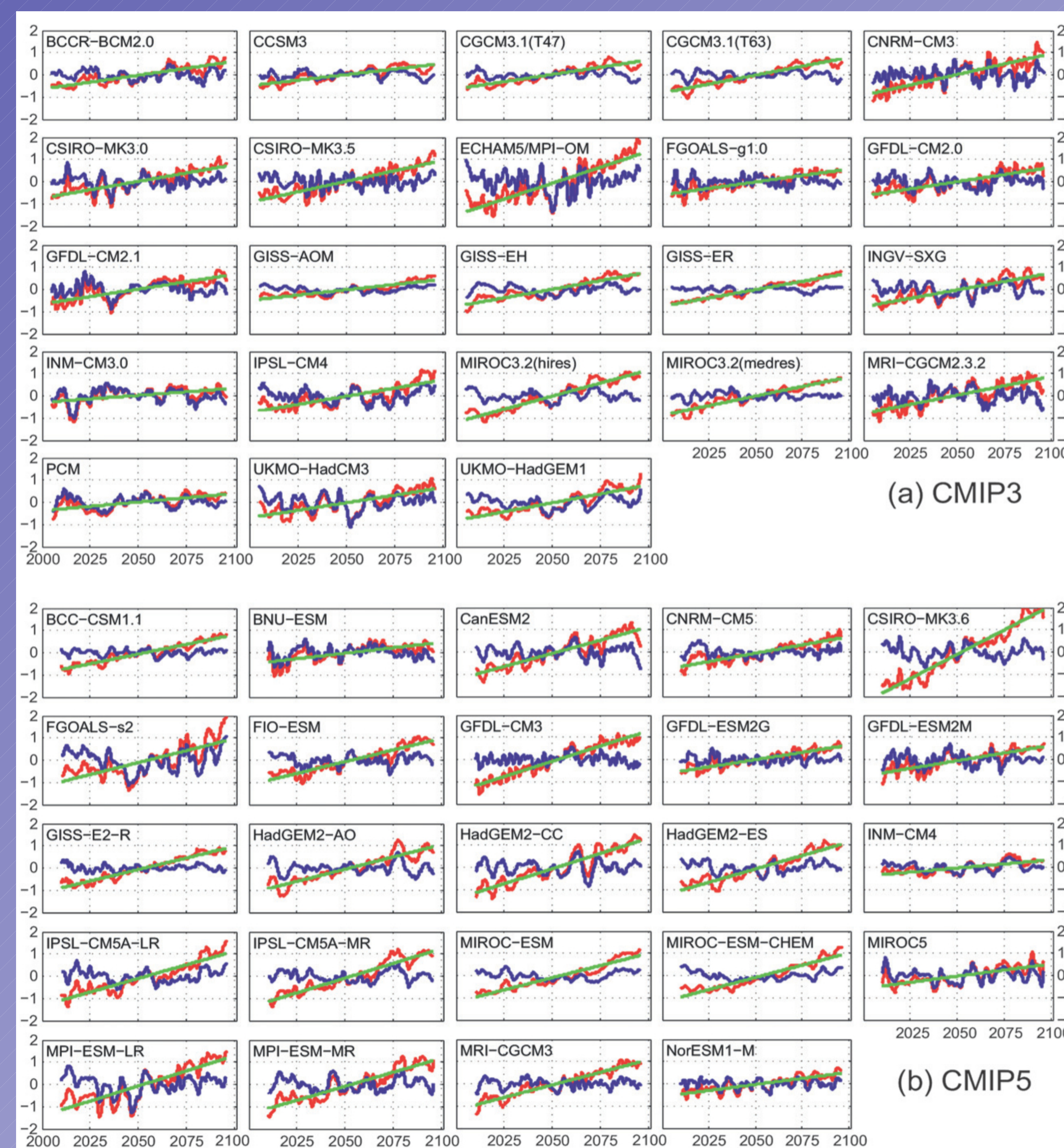
Square: 20th Century Triangle: 21st Century



Time series of relative AAM in the 21st Century

(a) CMIP3 (SRES A1B) (b) CMIP5 (RCP8.5)

Red: total Green: linear trend Blue: detrended series



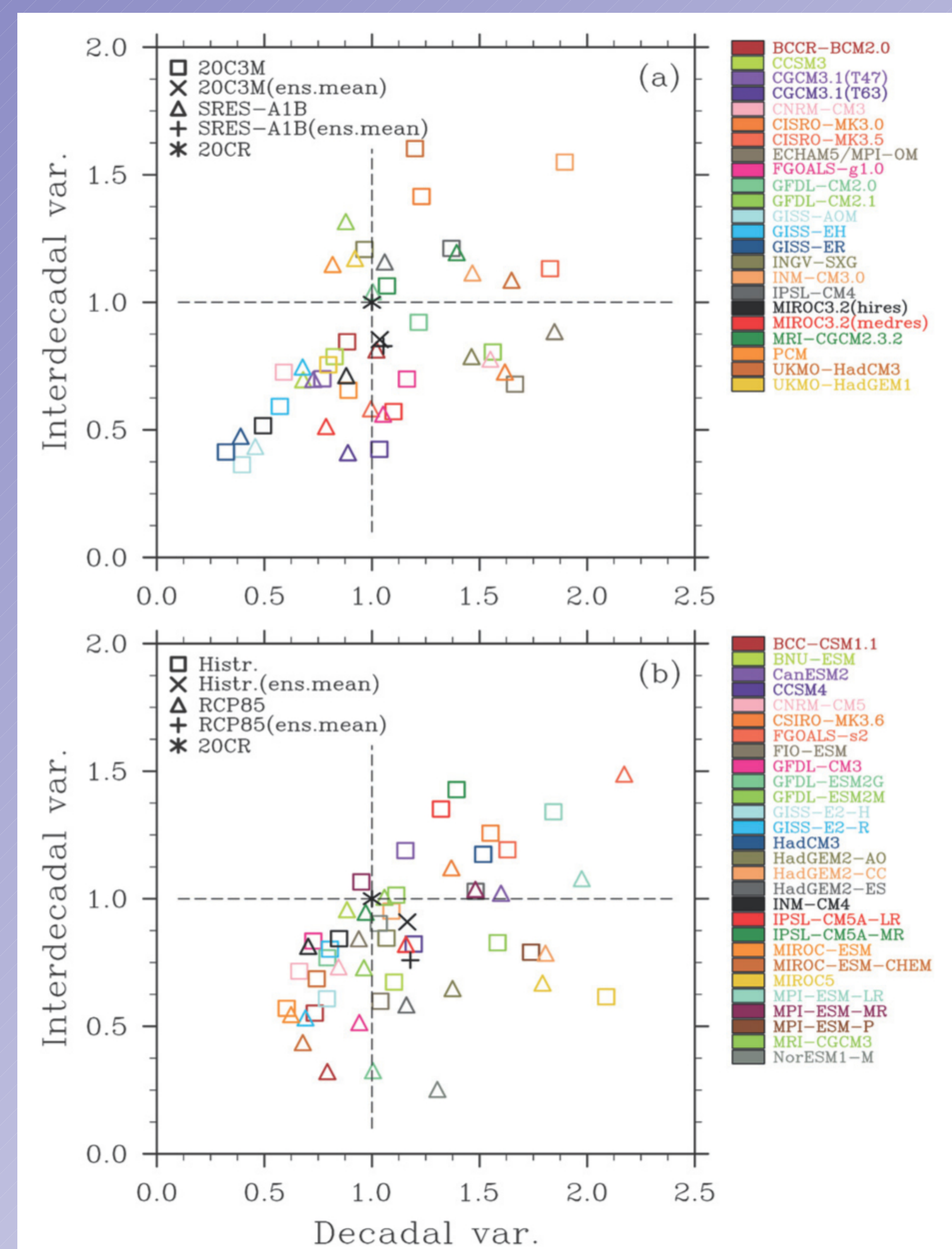
Decadal and interdecadal standard deviation normalized by 20CR values

(a) CMIP3 (20C3M & SRES A1B)

(b) CMIP5 (Historical & RCP8.5)

Square: 20th Century Triangle: 21st Century

Asterisk: 20CR reanalysis



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