

The phase relation between atmospheric carbon dioxide and global temperature

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In our analysis we use eight well-known datasets: 1) globally averaged well-mixed marine boundary layer CO₂ data, 2) HadCRUT3 surface air temperature data, 3) GISS surface air temperature data, 4) NCDC surface air temperature data, 5) HadSST2 sea surface data, 6) UAH lower troposphere temperature data series, 7) CDIAC data on release of anthropogenic CO₂, and 8) GWP data on volcanic eruptions

We find a high degree of co-variation between all data series except 7) and 8), but with changes in CO₂ always lagging changes in temperature. The maximum positive correlation between CO₂ and temperature is found for CO₂ lagging 11–12 months in relation to global sea surface temperature, 9.5–10 months to global surface air temperature, and about 9 months to global lower troposphere temperature. The correlation between changes in ocean temperatures and atmospheric CO₂ is high, but do not explain all observed changes.

Slik varierer mengden CO₂ i atmosfæren over året (rød kurve):



