

Semiannual oscillations of rainfall, botanical activity and carbon dioxide in the equatorial region

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In the vicinity of equator the solar radiation (maxima at the equinoxes), the mesospheric winds, the stratospheric ozone, the intertropical convergence zone (ITCZ) and easterly jet in the troposphere, the botanical activity and the human (agricultural) activity have striking semiannual periodicities. These are, except for the solar radiation determined astronomically (but being a cause of the others) interacting with each other. Recent observational evidence of carbon dioxide at Kototabang GAW station in Sumatera shows a striking semiannual periodicity (Fig. 1). Observations in other (mid- and high-latitude) regions have annual periodicities superposed on the monotonical increase of carbon dioxide considered as the cause of global warming, and they are considered due to botanical activities absorbing the carbon dioxide in the summer season. The semiannual periodicity of carbon dioxide in the equatorial region may also be due to the botanical activity with a similar periodicity. Relationships between them and the meteorological quantities are investigated based on our own observations in the maritime continent.

Kototabang-GAW観測所におけるCO₂ (BMGによる)

