

Solar Activity's Role in El Nino Southern Oscillation (ENSO) and Indian Oceanic Dipole (IOD)

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ENSO (El Nino Southern Oscillation) and Indian Oceanic Dipole (IOD) are oceanic anomaly and atmospheric phenomenon in equatorial pacific and indian ocean causing global climate system variation. ENSO which is indicated by Southern Oscillation Index (SOI) describes the air pressure between Darwin (Australia) and Tahiti (Southern Pacific Ocean). Meanwhile, Indian Oceanic Dipole (IOD), shown by Dipole Mode Index (DMI), describes the sea surface temperature difference between East region (on the West side of Sumatera) and West region (East side of Africa). Considering these events occur periodically at irregular interval, it might be triggered by the 11-years of solar cycle as an energy source. In this case, the solar activity is represented by the variability of the periodical Sunspot number (R). Changes in the rate of heating and the amount of solar energy package is presumed to be the cause of the ENSO and IOD phenomenon. In this work, we use the data of Sunspot number (R), SOI, and DMI from 1870 to 2013. Derived from those data, spectral analysis of the output energy package has been conducted in order to study its correlation with periodicity of ENSO and IOD, and also the connection between those events.

Keywords: ENSO, IOD, DMI, Sunspot number, Solar energy