Tropical Cyclones Activity in Southwest Pacific and Their Link to ENSO and Sunspot

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Abstract. The influence of the El Nino-Southern Oscillation (ENSO) and sunspots on tropical cyclone intensity in the Southwest Pacific is examined. The research is built on work in the study between sunspots, ENSO, and tropical cyclone intensity with different variables using ACE (Accumulated Cyclone Energy) and tropical cyclone frequency intensity. It has found that sunspots determine if a link is present between solar irradiance and tropical cyclone. The correlations in sunspot extreme years (maximum and minimum) increased from those over the entire cycle, with minimum years having the highest correlations to tropical cyclone intensity. Regression model show that increased sunspots number actually decrease tropical cyclone frequency and ACE. ENSO have also been examined to find the relation between tropical cyclone season and sunspot. The result shows that El Nino contribute >30 % of TC frequency. Also, strong El Nino on 2015-2016 and 1996-1997 contribute high tropical cyclone frequency and ACE (>20 and >100x10^{-4} knot) in Southwest Pacific. It is showed that sunspot need time lag to influence the La Nina and El Nino phenomena about 2-3 years. Sunspots should be considered for increased pre-seasonal tropical cyclones forecast accuracy and the inter-annual variability of tropical cyclones.