



Evidences of the solar influence on the tropical Pacific atmospheric circulation during last fifty years in the southern hemisphere magnetic anomaly region

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The influence of solar magnetic variability into the lower atmospheric regions has been observed on different atmospheric parameters. However, a plausible mechanism to explain these observations remains unclear. It is also indistinguishable whether or not the variability on the solar-terrestrial coupling drives the present climate change. The changes in the tropical Pacific circulation have been observed during last fifty years and they are attributed to the increase of the global surface temperature. However, new observations suggested a geomagnetic modulation of the net radiative flux in the southern tropical Pacific. Here we show that the Walker circulation in the tropical Pacific is related to the magnetospheric, ionospheric and upper atmosphere processes which propagate downward to the lower atmosphere. Furthermore, we show that the changes in the Walker circulation are related to the westward drift of the magnetic anomaly. We find that the dry, cool and high pressure subsidence branch of the Walker Circulation matches the inner region of the magnetic anomaly. We also find that the ascending branch of the Walker Circulation is in the border of the magnetic anomaly. We find that the sea-level pressure in the tropical Pacific is increasing as the magnetic field intensity is decreasing. Our results indicate a strong solar forcing of the Walker circulation.