



Climate network reveals the effect of deep equatorial Pacific ridge on El-Nino

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In spite of the intensive research of El-Nino, one of the most influential climate phenomenon on annual time scales, the origin of the emergence and dissipation locations of waves associated with El-Nino are still not settled. Here we develop a novel method that relies on network theory to quantify the properties of tropical El-Nino related Kelvin and Rossby oceanic waves, based on sea-surface height altimetry data. The climate network exhibits well-defined locations of the waves' initiation and termination and is used to quantify successfully the waves' characteristics. It is found that the location of the hubs of the out-going and in-coming links in this climate network are in concert with the locations of the westerly wind bursts (WWBs) and the deep Pacific (Kiribati) ridge respectively. This suggests that El-Nino dynamics is influenced by the very deep (~ 2 km) Kiribati ridge; this idea is supported by simulations of an oceanic general circulation model.