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A breakdown of ENSO-North Pacific Teleconnection in early January

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During El Niño winters, East Asia and western North America become anomalously warm because of the combined effect of anti-cyclonic circulation anomaly over Kuroshio Extension and Philippine sea, and an enhanced Aleutian Low. However, this El Niño-Southern Oscillation (ENSO)-North Pacific teleconnection disappears in early January. In this study, we suggest that this breakdown in regional teleconnection is partly due to Madden-Julian Oscillation (MJO). In early December of El Niño winters, MJOs frequently form and reach at Western Pacific, causing positive intraseasonal Pacific North American (PNA)-like teleconnection, which is same pattern to the El Niño teleconnection. In mid-December, however, as MJOs are frequently organized over Indian Ocean, it causes a destructive interference, cancelling El Niño teleconnection in early January. Although weak and not statistically significant, this sharp decline of ENSO teleconnection in early January also appears in La Niña winters. A preference of MJO organization and its propagation in ENSO winters are explained by moist static energy anomalies in the west Indian Ocean. This result suggests that MJO is important for predicting ENSO teleconnection on intraseasonal scales.