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Winter Precipitation variability over East Asia associated with ENSO

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The El Niño-Southern Oscillation (ENSO) exhibits the greatest influence on the interannual variability over not only the tropical Pacific, but the global climate. In addition, there are closely related with variability of East Asian monsoon. We investigate winter precipitation variability associated with ENSO over East Asia during recent 30 years (1980-2009). In early winter, during El Nino peak phase, correlation coefficients between precipitation and Nino 3 SST over East Asia including Korean peninsula are significantly strong positive, but the correlation is significantly weakened and even negative in January. In early winter, the strong positive correlation of precipitation, accompanied by the strong southerly wind is induced by Philippine Sea anticyclone and strong anticyclonic flow over the Kuroshio expansion region (hereafter called the "Kuroshio anticyclone"). However, in January, the precipitation tends to decrease because that the Kuroshio anticyclone suddenly disappears, though the Philippine Sea anticyclone further develops. These results indicate that the Kuroshio anticyclone during El Nino peak phase play a critical role in strongly affecting Northeast Asia climate including Korea, Japan and North China. We suggest here that the Kuroshio anticyclone is related to the precipitation on the equator. In order to further understand dynamical process of the Kuroshio anticyclone in North Pacific, we carried out the linear baroclinic model (LBM) experiments. Based on the LBM modeling, it is revealed that the Kuroshio anticyclone is influenced by negative precipitation forcing over the western Pacific in December and its sudden disappearance in January is affected by the strengthened positive precipitation forcing over the eastern Pacific.