The concentration of surface ozone in East Asia is high due to strong solar radiation, but decreases in areas affected by summer monsoons. This study analyzes the summer surface ozone variations in East Asia using meteorological and atmospheric chemistry variables in 12 models participating in Chemistry-Climate Model Initiative (CCMI) for the period of 1979 to 2010. The concentration of 850 hPa ozone was identified two modes by Empirical Orthogonal Functions (EOF) analysis. The first mode is an increase in all regions over East Asia, mainly in eastern China. This mode was associated with downward wind, weak horizontal wind speed, increase in temperatures, decrease in precipitation. The second mode showed high ozone concentrations in eastern China and low in northern Japan. In eastern China, temperatures and precipitation are decreased, and shortwave radiation reaches the surface is increased. In addition, the concentration of nitrogen oxides and carbon monoxide and the net ozone production are increased. The second mode was highly correlated with El Nino-Southern Oscillation (ENSO) and western North Pacific subtropical high (WNPSH) indices and was found to be closely associated with East Asian summer monsoons.

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