



Intraseasonal to interannual variations in the tropical wave activity revealed in reanalyses and their potential impact on the QBO

Young-Ha Kim and Changhyun Yoo
Ewha Womans University, Seoul, South Korea

We investigate activities of tropical waves represented in reanalysis products. The wave activities are quantified by the Eliassen–Palm (EP) flux at 100 hPa, after decomposed into the following four components: equatorially trapped Kelvin waves and mixed Rossby-gravity waves, gravity waves, and Rossby waves. Monthly EP fluxes of the four waves exhibit considerable temporal variations at intraseasonal and interannual, along with seasonal, time scales. These variations are discussed with the tropical large-scale variabilities, including the Madden-Julian Oscillation (MJO), the El Niño-Southern Oscillation, and the stratospheric quasi-biennial oscillation (QBO). We find that during boreal winter, the interannual variation of Kelvin wave activity is in phase with that of the MJO amplitude, while such a simultaneous variation cannot be seen in other seasons. The gravity wave is dominated by a semi-annual cycle, while the departure from its semi-annual cycle is largely correlated with the QBO phase in the stratosphere. Potential impacts of the variations in the wave activity upon the QBO properties will be assessed using a simple one-dimensional QBO model.