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# Spatio-temporal analysis of extreme sea level in the Korean Peninsula

**Jung-A Yang**
Korea University, Future and Fusion Lab of Architectural, Civil and Environmental Engineering, Architectural, Civil and Environmental Engineering, Seoul, Korea, Republic of (yangja.1985@gmail.com)

Various countries around the world have been experiencing coastal disasters caused by coastal flooding, and Korean Peninsula is no exception. Most coastal flooding occurs during extreme sea level conditions which is comprised astronomical tides, nontidal residuals, wind wave, and mean sea level. To respond to coastal flooding disasters, it is important to understand the characteristics of extreme sea levels. Therefore, this study analyzed the spatiotemporal patterns of extreme sea levels along the Korean Peninsula and evaluated the effects of the astronomical tides and nontidal residuals represented by storm surges on extreme sea levels among the components constituting extreme sea levels. At this time, when analyzing the impact of the storm surge, it was evaluated whether the storm surge was caused by tropical cyclones or extra-tropical cyclones, and what storm condition were more dangerous in the Korean Peninsula. This study collected observed tidal data from 1979 to 2021 at 48 tide stations which are installed along the coast of the KP and performed a hormonic analysis to distinguish them into astronomical and storm surge components. In this case, storm surges occurring in summer and winter were considered to be caused by tropical cyclones and continental cyclones, respectively. In addition, to more accurately analyze the regional characteristics, the Korea's coast was divided in the three zones: the East Sea, the West Sea, and the South Sea. As a result of the study, it was found that the extreme sea levels along the Korean Peninsula showed regional differences, and in the case of the south coast, storm surges generated by tropical cyclones were the main drive of extreme sea levels.