

Development of GNSS-based crustal Deformation monitoring system

Seung Jun Lee (SUNGKYUNKWAN UNIVERSITY), Hong Sic Yun (SUNGKYUNKWAN UNIVERSITY), Myeong Hun Lee (SUNGKYUNKWAN UNIVERSITY), Jinzhen Han (SUNGKYUNKWAN UNIVERSITY), Canying Shen (SUNGKYUNKWAN UNIVERSITY) and Minkyung Cho (SUNGKYUNKWAN UNIVERSITY)

Abstract. Earthquakes occurring at the boundary and fault of each tectonic plate occur when stress in the tectonic plate accumulates at a constant speed is discharged at a constant period. To calculate the stress accumulated in the crust, data from 85 GNSS CORS (continuously operating reference stations) in south Korea were used. The period of data used was from January 1, 2016 to February 26, 2022, and three S/Ws were used: Gamit/Globk, Bernese, and Gipsy. The three S/Ws were developed to be automatically released every day using 85 GNSS CORS data, and were designed to upload calculated results on the website. The GNSS Orbit Products used in the calculation process are calculated using Ultra Rapid at the time Rinex Data is uploaded, Rapid after 5 days, and Final after 23 days. The Delaunay Triangle was constructed using X, Y, and Z of 85 calculated GNSS CORSs, calculated as geodesic lines for each baseline, and designed to be calculated to 13 decimal places to reduce errors. The main stress generated in the triangular network was calculated based on the tensile strength and compression of the baseline, and the possibility of earthquake occurrence was predicted based on the main stress. All calculations are designed to be calculated by anyone on the website, and the period is free.