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INVESTIGATION OF DIRECTIONAL PROPERTY OF SEISMIC GROUND MOTIONS AND PROPOSAL OF AVERAGE DIRECTION FOR EARTHQUAKE DAMAGE ESTIMATION

SAKAI Yuki[1] and KUMAMOTO Takumi[2]

1 Member, Professor, Graduate School of Systems and Information Eng., Univ. of Tsukuba, Dr. Eng.
e-mail : sakai@kz.tsukuba.ac.jp
2 Toyota Motor Corporation(former Graduate Student, Graduate School of Systems and Information Eng., Univ. of Tsukuba), M. Eng.
e-mail : takumi_kumamoto@mail.toyota.co.jp

ABSTRACT: Directional property of seismic ground motions was quantitatively investigated. We made elastic response spectra in all 36 directions from past strong ground motion records and calculated coefficient of variance for various seismic intensity and response acceleration spectra changing period range. The average and maximum coefficients of variance were about 20% and 40%, respectively. We proposed 'average direction' of seismic ground motions in which the 0-3 sec. average response acceleration is equal to the average of all directions. This concept is useful in the earthquake damage estimation because we could reproduce actual structural damage by earthquake response analyses using SDOF systems under the input of seismic ground motions in the 'average direction'.

Key Words: Seismic Ground Motion, Directional Property of Seismic Ground Motion, Elastic Response Spectrum, Average Direction, Building Cluster Model