Kyoichiro Kondo and Izuru Takewaki, 2019, Simultaneous approach to critical fault rupture slip distribution and optimal damper placement for resilient building design, *Frontiers in Built Environment,* 24 October 2019, https://doi.org/10.3389/fbuil.2019.00126.

Abstract The uncertainties in ground motions may result from several factors, e.g., (i) the fault rupture process, (ii) the wave propagation, (iii) the site amplification from the earthquake bedrock to the ground surface. The uncertainty in the fault rupture slip is taken as a main factor of uncertainties in the present paper and the critical fault rupture slip distribution causing the maximum structural response is found by using the stochastic Green's function method as a generator of ground motions. Then, a multi-degree-of-freedom (MDOF) building structure is introduced as a model structure and an optimal damper placement problem is discussed for the critical ground motion. The main topic in this paper is the simultaneous determination of the critical fault rupture slip distribution and the optimal damper placement. The sequential quadratic programming method is used in the problem of critical fault rupture slip distribution and a sensitivity-based method is introduced in the optimal damper placement problem. Furthermore, the robustness for the maximum interstory drift in MDOF building structures under the uncertainty in fault rupture slip distributions is presented for resilient building design by using the robustness function. Since the critical case leads to the most unfavorable structural response, the proposed method can provide structural designers with a promising tool for resilient building design.