

Review for se-2022-17

The article titled “Numerical Simulation of Present-day Kinematics at the Northeastern Margin of the Tibetan Plateau” focuses on the slip rates of active faults at the northeastern margin of the Tibetan Plateau. It is very important to understand the lateral expansion of the Tibetan Plateau and assess the seismic hazards in this region. By use of a three-dimensional geomechanics-numerical model, the authors obtained the horizontal and vertical crustal velocities and slip rates of active faults in the study area. The results are closely consistent with the observation in the area. The reviewer considers that this article is worth publishing on Solid Earth.

The authors collected and researched previous relative works in this area and constructed a reasonable numerical model. The design for the geometric layering and block division, the rock properties, the boundary condition and other parameters are suitable. The results are reasonable and important for scientific research and seismic hazard analysis in this area.

It is a pity that the authors have not paid attention to the important information given in Fig.11 during they discuss the “Fault slip rates and seismic hazards” in 4.2. Theoretically research and practical observations show that the isolated uplift area is the most dangerous place for earthquakes. So the review suggests that the authors pay attention to the result of the vertical velocity and slip rate of active faults in Fig. 11. The intersection location of areas with positive velocity value and the relative active fault is the most hazardous seismic location. The reviewer strongly suggests the authors reevaluate the earthquake risk regions by consideration of this factor combined with others. Another suggestion is that the authors can illustrate what finite element software is used in the modeling and the reason.

Generally speaking, this is a very good article both in the modeling and in the research area.