# Experts recommend modeling to avoid earthquakes resulting from fracking

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Using computer analysis prior to drilling could limit seismic events as a result of hydraulic fracturing, according to new research published in the *Canadian Geotechnical Journal*.

Hydraulic fracturing, also known as "fracking", is used to break the subsurface rock mass into pieces and is done by injecting high-pressure fluid. While this gives the fluid or gas more paths to reach production wells, it also leads to several environmental problems, one of which is the unwanted shaking of the ground structures caused by the movement of large faults. Evaluating the seismic effects of fracking before drilling is particularly important as many Enhanced Geothermal Systems (EGS) or hydrocarbon extraction operations occur in tight rock masses and in close vicinity to fault zones. New research published in the *Canadian Geotechnical Journal* addresses the issue of unwanted seismic events by proposing a numerical modeling process to evaluate the effects of hydraulic fracturing prior to drilling.

"By using this process, the hydraulic fracturing industry will be able to infer how potential fluid injection operations can change the movement of the fault systems," says the lead author of the study Jeoung Seok Yoon, Helmholtz-Centre Potsdam - GFZ German Research Centre for Geosciences. "These findings are particularly relevant to the shale gas industry as extraction of shale gas has the undesired potential effect of induced seismic events activating a nearby fault".

According to the research, to avoid unwanted seismic events and to

improve the safety of hydraulic fracturing operations, a series of numerical models should be conducted to design a carefully implemented hydraulic stimulation scheme. The modeling technique presented in this paper is a hydromechanical-coupled dynamic model, which provides unique solutions to the issue of defining risk when drilling near fault zones.

"In our opinion, regulators should require industry to undergo this kind of numerical modeling testing prior to drilling to better estimate the potential hazard beforehand," continues Jeoung Seok Yoon. "It is essential that mechanisms of fluid injection-induced seismicity and fault reactivations are better understood in order to avoid the larger events induced by fluid injection".

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