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Man-Made Earthquakes and New Vision on Seismic Hazard Assessment

There is a growing concern about the potential for destructive earthquakes caused by human activity. Studies of seismicity related to impoundment of reservoirs, injection of fluids in a well, withdrawal of fluids and mining activity, all bear evidence to the presence of critically stressed rocks in the earth's crust, where in small stress changes, induced by human activity, trigger earthquakes. The most known type of man-made earthquakes are dam Reservoir Induced/Triggered Seismicity (RIS/RTS) because of its wide usage all over the world. Seismicity induced by human activity is confined in both space and time, and its study can lead to a better understanding of the physics of earthquakes.
Reservoir impoundment can trigger seismicity in two ways; an immediate, undrained response to loading, and a delayed response due to the diffusion of pore pressure. We have studied RIS/RTS associated with 4 great dams of Iran territory from years ago, before and after impoundment. It gives a new vision to seismic hazard assessment based on collected data from local seismography networks operating for dam monitoring. The effect of dam filling and the rate of seismicity because of water level change is studied and clear evidences of filling effects are presented.

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