

A model of lithospheric strength with a minimum for seismogenic zone in the continental crust

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We show a modified model of lithospheric strength inferred from our laboratory experiments indicating that strength values of a granite are unusually low between 473K and 553K with a minimum at around 520K in the high-pressure type fracture regime that occurs when the compressive strength equals the frictional strength. The lithospheric strength inferred from these experimental results and our previous assumption that the high-pressure type fracture occurs in the crust considering the size effect of rock strength, suggests a low-strength zone between 8 and 14 km depth with a minimum at around 12 km. This suggestion could provide an alternative explanation for the brittle-ductile hypothesis: earthquakes could occur or nucleate more easily where the strength is low.