

AOB Seminar

「 Self-similarity in rocks fracturing and related complex critical exponents 」

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Research Center for Prediction of Earthquakes and Volcanic Eruptions
Conference Room I (annex of AOB)

--- Abstract ---

The multistep character of arising damages in brittle materials or rocks, reflecting the discrete nature of the fracturing process, make it possible to compare diffusion of damages with diffusion on random lattices. Based on discrete scale hierarchy, the fracturing process leading to materials failure is then identified with a second order phase transition, which makes possible some predictions. In connection, this paper is intended to expose a prediction scheme of catastrophic failure or lifetime of highly loaded materials or rocks. An experimental measurement method and a modelling for biphasic materials or rocks are proposed. Although this scheme is introduced in the context of materials science, it work also in rock mechanics in order to predict the event of large natural earthquakes and some artificially induced earthquakes and rock bursts due to dam and mining. A result with strong consequences for forecasting explains for the first time the origin of complex critical exponents through a structural parameter.

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詳細情報 : <http://www.aob.geophys.tohoku.ac.jp/res-edu/AOBseminer.html>

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