Application of microboudin method for estimetiong of palaeo-stress magnitude

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The purpose of this study is to apply the microboudin method for the estimation of stress magnitude. The microboudin method is apotential palaeo-piezometer that determines two parameters. One factor is cslled lambda,calculated from proportion of boudinaged grains in metamorphic tectonites. The analysis of lambda was recently formulated by Masuda et al. (2003). The other factor is the modal tensile strength (S*) of the grain whose aspect ratio is 1. In the microboudin method, we are able to estimate the magnitude of the far-field differential stress (sigma0) by multiplying lambda with S*.

In this study, we measured the fracture strength of millimeter-scale single crystals in the three-point bending test and considered fracture mechanics using Weibull statistics to estimate the true strength of natural micrometer-scale minerals (S*). Using these data, we can estimate the stress magnitude from the microboudin method. We analyzed 6 samples of high-pressure metamorphic zone, Japan. The values have around 200MPa.