

Refined boudinage method for piezometer

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<http://www.sci.shizuoka.ac.jp/~geo/Lab/Structure/Students/masslab.html>

The purpose of this study is to refine the boudinage method for palaeo-differential stress estimation. We measured a proportion of boudinaged grains of tourmaline embedded in quartz matrix in a meterchert from Wadi Tayin (Oman), and in a pegmatite from Greenbushes (Australia). The theoretically derived provability density function of boudinaged grains is fitted these data using (1) formula, where r is the aspect ratio of fiber, m is Weibull parameter, E_f , E_m are Young's model of fiber and matrix, and A is a constant. λ is a ratio of far-field differentiated stress(σ_0) to fracture strength of a unit fiber(S^*) expressed as formula(2).

In this paper we will show how fine the fitting of $G(r,\lambda)$ to the measured proportion of boudinaged grains.

$$G(r,\lambda) = 1 - \exp \left[-\frac{m-1}{m} r \lambda^m \left(\frac{E_f}{E_m} \right)^m \left\{ 1 - \left(1 - \frac{E_m}{E_f} \right) \frac{1}{\cosh(Ar)} \right\}^m \right] \dots \dots \dots (1)$$

$$\lambda = \frac{\sigma_0}{S^*} \dots \dots \dots (2)$$