SVC53-P07 Room:Poster Time:April 28 18:15-19:30

Paleostress analysis of dilational fractures using genetic algorithm

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The attitudes of dilational fractures, including dikes and veins, are clues to the paleostresses under which the structures were formed. A software tool for clustering their 3D orienatations has been developed in this study. The software fits mixed Bingham distributions to them, and detects girdle, elliptical and circular clusters. In addition, it determines the three principal stress axes, stress ratios and maximum fluid pressure for each of the clusters. Fitting a mixed Bingham distribution is not a well posed problem, because the mathematical inversion is highly non-linear and its object function is multimodal. It is demonstrated that genetic algorithm is more effective than the expectation-maximization algorithm which was used by previous researchers (Yamaji and Sato, 2011).

Keywords: real-coded genetic algorithm, magma pressure, mixed Bingham distribution, dike, vein