



Angular stress distance as a new dissimilarity measure for stress tensors determined by the inversion of fault-slip or focal mechanism data

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Stress tensor inversion has been used for elucidating not only the present state of stress at depths from seismological data but also paleostresses from fault-slip data obtained at outcrops. When the reliability of its solutions is evaluated, the dissimilarity or distance between the solutions is important. Here, we define a measure, angular stress distance. Although the distance is defined in an abstract five-dimensional parameter space of the inversion, it has corresponding quantities in the physical space. Most importantly, it approximates the expectation of angular difference in the slip directions resulting from the two stresses that are separated by this distance. There are other important features, including the equivalence of the distance with the difference in Lode angles of the stresses in question, provided that the stresses has the same principal orientations. The distance has one-to-one correspondence with the correlation coefficient of the corresponding components of the stresses. The features are useful for studying the theoretical aspect of stress tensor inversion.