



An old problem revisited: What do fission track ages of sediments tell us?

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What do fission track (FT) ages of sediments tell us? It seems to be an evergreen question, not only because of the limitations of the FT methodology, but also because of the type and thermal history of the material to be analysed.

The statistical approach of the mixed populations is well-known and widely applied. However, in FT it is applied only to a limited extent. The main reason for that is, in most of the cases, the low number of observation i.e., the grains counted. Only a few method can handle such low number of data, and the well-known (and popular) methods, like chi-square test would fail or, what is worse, will tell something invalid.

In our previous work we proposed an approach for separation of two or three component mixtures, the so-called PopShare algorithm. The advantage of the approach is that the fitting is always done in the cumulative distribution, so there is no need for histogram creation. Now, we renew our proposal to categorize the FT data and determine a so-called "distance" between the measurement results. We define a metric, known from mathematics, to measure the distance between two observations.

The main reason for this step is to determine a spread for a given sedimentary rock. If this material have a typical distance of, say, R between the measurements, then any other measurements within this R "distance" are practically indistinguishable from each other. Consequently, only those distributions can be considered as derived from other set, that falls "outside" this limit. In other words R acts like a radius separating the various measurements.

The distance calculation is based on Kolmogorov-Smirnov statistic, that fulfills the

requirements of a metric. One would need a number of data sets to define such a system, but the advantage is then the ability to define categories and the possibility to tell the distance from the predefined clusters.