

ELECTRONIC ARTICLE

**AFTSolve: A program for multi-kinetic modeling of apatite fission-track data**

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**ABSTRACT**

AFTSolve is a computer program for deriving thermal history information from apatite fission-track data. It implements a new fission-track annealing model that takes into account the known kinetic variability among different apatite species. To fully utilize this model, a fission-track worker must obtain data that can be used to infer the kinetic characteristics of each apatite grain from which a measurement was taken. Such data can consist of etch figure lengths or chemical composition. The benefit of this overall approach is that it allows useful information to be derived from previously unusable analyses, extends the practical range of geological temperatures constrained by fission-track analyses, and increases overall confidence in model predictions. AFTSolve also incorporates the effects of fission-track orientation relative to the apatite crystallographic *c*-axis, variation in initial track length, and the biasing effect of <sup>252</sup>Cf irradiation for enhancing confined horizontal track length detection. AFTSolve is written for Windows operating systems, and has a graphical interface that allows interactive input of thermal histories and real-time generation of estimates for fission-track length distributions and ages for up to six simultaneously modeled kinetic populations. It also includes procedures for estimating the range of time-temperature histories that are statistically consistent with a data set and constraints entered by the user.

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