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Anisoft - Advanced treatment of magnetic anisotropy data

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Since its first release, Anisoft (Anisotropy Data Browser) has gained a wide popularity in rock magnetic and structural geology community mainly due to its simple and user-friendly interface enabling very fast visualization of magnetic anisotropy tensors. Here, a major Anisoft update is presented transforming a rather simple data viewer into a platform offering an advanced treatment of magnetic anisotropy data.

The updated software introduces new enlarged binary data format which stores both in-phase and out-of-phase (if measured) susceptibility tensors (AMS) or tensors of anisotropy of magnetic remanence (AMR) together with their respective confidence ellipses and values of F-tests for anisotropy. In addition to the tensor data, a whole array of specimen orientation angles, orientation of mesoscopic foliation(s) and lineation(s) is stored for each record enabling later editing or corrections. The input data may be directly acquired by AGICO Kappabridges (AMS) or Spinner Magnetometers (AMR); imported from various data formats, including the long-time standard binary ran-format; or manually created (in case one has anisotropy data in a non-electronic form). AMR tensors together with their respective confidence ellipses can be directly calculated if an array of directional measurements of magnetic remanence is provided. Multiple anisotropy files can be combined together by opening them simultaneously or split into several files by manual data selection or data filtering according to their values.

Anisotropy tensors are conventionally visualized as principal directions (eigenvectors) in equal-area projection (stereoplot) together with a wide array of quantitative anisotropy parameters presented in histograms or in color-coded scatter plots showing mutual relationship of up to three quantitative parameters. When dealing with AMS in variable low fields, field-independent and field-dependent components of anisotropy can be determined (Hrouda 2009). For a group of specimens, individual principal directions can be contoured, or a mean tensor and respective confidence ellipses of its principal directions can be calculated using either the Hext-Jelinek (Jelinek 1978) statistics or the Bootstrap method (Constable & Tauxe 1990).

Each graphical output can be exported into several vector or raster graphical formats or, via clipboard, pasted directly into a presentation or publication manuscript. Calculated principal directions or anisotropy parameters can be exported into various types of text files ready to be visualized or processed by any software of user's choice.