

DZmds

Saylor et al. (2017)

DZmds is a program used for multidimensional scaling (MDS) of detrital zircon U-Pb age distributions developed by Joel Saylor at the University of Houston, Department of Earth and Atmospheric Sciences. MDS facilitates comparison of detrital age distributions by producing a Cartesian plot in N dimensions (usually 2 or 3) through conversion of intersample dissimilarity to disparity via linear transformation and iterative reengagement in Cartesian space. MDS seeks to minimize the misfit between distance and disparity (stress). Low stress (e.g., < 0.1) indicates a reasonable transformation. MDS was originally adapted for detrital data by Vermeesch (2013) using the Kolmogorov-Smirnov (KS) Test D statistic (Massey, 1951). In addition to the KS Test, DZmds implements three more quantitative comparison methods to calculate intersample dissimilarity including the Kuiper Test V statistic (Kuiper, 1960) for cumulative distribution functions (CDFs); and Cross-correlation (Saylor et al., 2012) and Likeness (Satkoski et al., 2013) for probability density plots (PDPs) or kernel density estimates (KDEs).

For a detailed description of the methods implemented in DZmds, and for proper citation, please reference the following paper:

Saylor, Joel E., Jessica C. Jordan, Kurt E. Sundell, Xiaoming Wang, Shiqi Wang, and Tao Deng. "Topographic growth of the Jishi Shan and its impact on basin and hydrology evolution, NE Tibetan Plateau." Basin Research 30, no. 3 (2017): 544-563.

Note that this program requires the MATLAB Runtime. The Runtime is free and only needs to be installed once. Following installation and upon running DZmds, the Runtime will automatically be accessed; there is no need to open the Runtime directly. If you have comments/questions about any of the files, please contact or Joel Saylor (joelsaylor@gmail.com) or Kurt Sundell (kurtsundell@gmail.com)

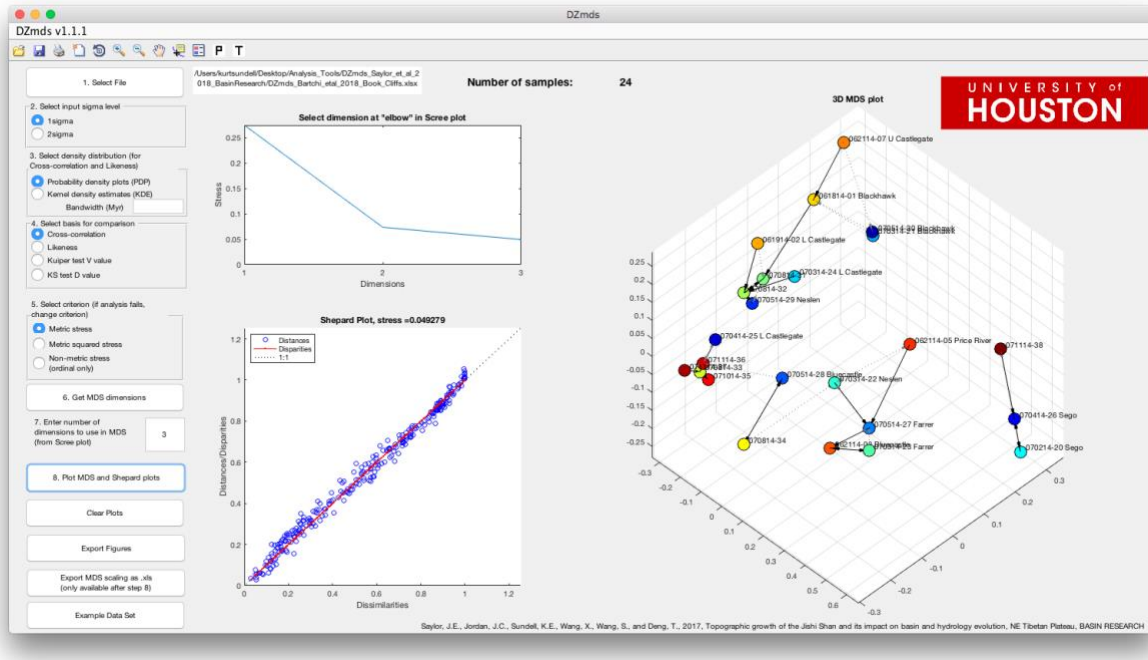
Following are links to the latest version of DZmds, example data sets, user manual, and a PDF of Saylor et al. (2017), and MATLAB Runtime:

[DZmds for Windows and macOS, example data, user manual, publication](#)

[MATLAB Runtime Compiler for Windows \(free, and required to run DZmds\)](#)

[MATLAB Runtime Compiler for macOS \(free, and required to run DZmds\)](#)

Example: Book Cliffs strata (Bartschi et al., 2018)



References

- Bartschi, Nicolas C., Joel E. Saylor, Thomas J. Lapen, Michael D. Blum, Bridget S. Pettit, and Ross A. Andrea. "Tectonic controls on Late Cretaceous sediment provenance and stratigraphic architecture in the Book Cliffs, Utah." *Bulletin* 130, no. 11-12 (2018): 1763-1781.
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- Massey Jr, Frank J. "The Kolmogorov-Smirnov test for goodness of fit." *Journal of the American statistical Association* 46, no. 253 (1951): 68-78.
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- Saylor, Joel E., Brian K. Horton, Daniel F. Stockli, Andrés Mora, and Jaime Corredor. "Structural and thermochronological evidence for Paleogene basement-involved shortening in the axial Eastern Cordillera, Colombia." *Journal of South American Earth Sciences* 39 (2012): 202-215.
- Saylor, Joel E., Jessica C. Jordan, Kurt E. Sundell, Xiaoming Wang, Shiqi Wang, and Tao Deng. "Topographic growth of the Jishi Shan and its impact on basin and hydrology evolution, NE Tibetan Plateau." *Basin Research* 30, no. 3 (2017): 544-563.
- Vermeesch, Pieter. "Multi-sample comparison of detrital age distributions." *Chemical Geology* 341 (2013): 140-146.