

## Multi-platform applications generated from MATLAB codes for viewing and analyzing demagnetization and directional data

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Directional paleomagnetic data are now processed through a routine workflow, and many kinds of on- or off-line softwares have been provided for viewing and analyzing paleomagnetic data (e.g., PuffinPlot [Lurcock and Wilson, 2012], Paleomagnetism.org [Koymans et al., 2016], PmagPy [Tauxe et al., 2016]). However, some of these softwares were left unupdated in spite of continually updated operating systems (OS). Each analyzing software requires a particular data format that needs to be converted from exported data of measuring softwares. Among paleomagnetists in Japan, a simple data format has been shared for more than 30 years along with DOS or Macintosh applications “Progress” and “Direction” developed by Prof. Shibuya at Kumamoto University. In order to succeed these established applications, we developed multi-platform applications with graphic user interface (GUI) based on a MATLAB code UPmag for analyzing U-channel data [Xuan and Channell, 2009].

There are two separate applications available: for viewing and fitting stepwise demagnetization data on Zijderveld and equal-area plots, and for viewing directional data on an equal-area plot and calculating the Fisher statistics. The data format remains simple; for demagnetization data it just needs three parameters in a polar coordinate of declination, inclination and intensity at each demagnetization level. For directional data only declination and inclination are necessary for each specimen or site. Users can confirm demagnetization intervals to be fitted on Zijderveld and equal-area plots before performing the fitting. Fitted data can be exported to a text file and handed out to the direction application. Fisher statistics parameters can be stored in a text file. You can save drawings in a variety of format such as pdf, jpeg, tiff, bmp etc. Later you can process the drawings for presentation or manuscript preparation with graphic softwares.

Both applications run on Windows (32 and 64 bits), Macintosh OS X, and Linux. Any MATLAB license is not needed to use the applications, just download a software package at <http://mpms.doshisha.ac.jp/pd16/pd16top.html> and MATLAB Runtime will be automatically installed. The MATLAB source code is also available, so if you prefer you can run the MATLAB programs and also modify them on your own right. Future update of the applications adapted to updated OS will be easily carried out by ourselves or others using updated MATLAB.

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