



[Start](#) | [Author Index](#) | [View Uploaded Presentations](#) | [Meeting Information](#)

2015 GSA Annual Meeting in Baltimore, Maryland, USA (1-4 November 2015)

Paper No. 12-2

Presentation Time: 8:20 AM

ORIENT 3: A NEW INTEGRATED SOFTWARE PROGRAM FOR ORIENTATION DATA ANALYSIS, KINEMATIC ANALYSIS, SPHERICAL PROJECTIONS, AND SCHMIDT PLOTS

[VOLLMER, Frederick W.](#), Geology Department, SUNY New Paltz, 1 Hawk Drive, New Paltz, NY 12561, vollmerf@newpaltz.edu

Orient 3 is a new professional orientation data analysis and spherical projection program, with a user-friendly interface and simple data input. In 1986 Orient introduced modified Kamb contouring, Point Girdle Random diagrams, orientation fields, and automated domain analysis. Orient 3 brings a new level of accuracy and speed, with new tools, including interactive data analysis, UTM coordinate conversions, digitizing, and integration with Microsoft Excel, LibreOffice, Adobe Illustrator, InkScape, CorelDRAW, and Google Earth. Features include circular histograms and frequency plots; upper and lower hemisphere orthographic, stereographic, and equal-area projections; Fisher, Watson, and Bingham confidence cones; unlimited coordinate system and data rotations; extensively configurable plots and symbols; color gradient plots; and vector graphics. The User Manual includes numerous tutorials, and a clarification of spherical projection terminology. The *stereographic projection*, $r = R \tan(\pi/4 - \delta/2)$, was known to the Greeks Hipparchus and Ptolemy, and given its present name by François d'Aguilon in 1613. The *Lambert azimuthal equal-area projection*, $r = (2/\sqrt{2}) R \sin(\pi/4 - \delta/2)$, was invented by Lambert in 1772. In 1925 Walter Schmidt recognized that the stereographic projection was unsuitable for orientation data analysis due to its distortion of area, and introduced the equal-area projection for fabric analysis. Rejecting the stereographic, or Wulff, net used by mineralogists, Schmidt introduced the *equal-area net*, or *Schmidt net*, and data contouring. In 1944 Walter H. Bucher introduced the use of stereographic nets in structural geology, defining *stereonet* as a contraction of *stereographic net*, and *stereogram* as a diagram produced using the net. Diagrams produced using Schmidt's equal-area method are ubiquitous in structural geology and tectonics, however no succinct term exists for them. The term *Schmidt plot* is proposed for a lower-hemisphere Lambert azimuthal equal-area spherical projection of three-dimensional orientation data, such as foliation planes, joints, slickensides, magnetic vectors, crystallographic axes, fold axes, and lineations. These plots have been in common use in structural geology, tectonics, and related disciplines, since their introduction by Walter Schmidt in 1925.

Session No. 12

[T70. Digital Technology in Real and Virtual Geoscience Experiences I](#)

Sunday, 1 November 2015: 8:00 AM-12:00 PM

Room 339 (Baltimore Convention Center)

Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p.49

© Copyright 2015 The Geological Society of America (GSA), all rights reserved. Permission is hereby granted to the author(s) of this abstract to reproduce and distribute it freely, for noncommercial purposes. Permission is hereby granted to any individual scientist to download a single copy of this electronic file and reproduce up to 20 paper copies for noncommercial purposes advancing science and education, including classroom use, providing all reproductions include the complete content shown here, including the author information. All other forms of reproduction and/or transmittal are prohibited without written permission from GSA Copyright Permissions.

[Back to: T70. Digital Technology in Real and Virtual Geoscience Experiences I](#)

[<< Previous Abstract](#) | [Next Abstract >>](#)
