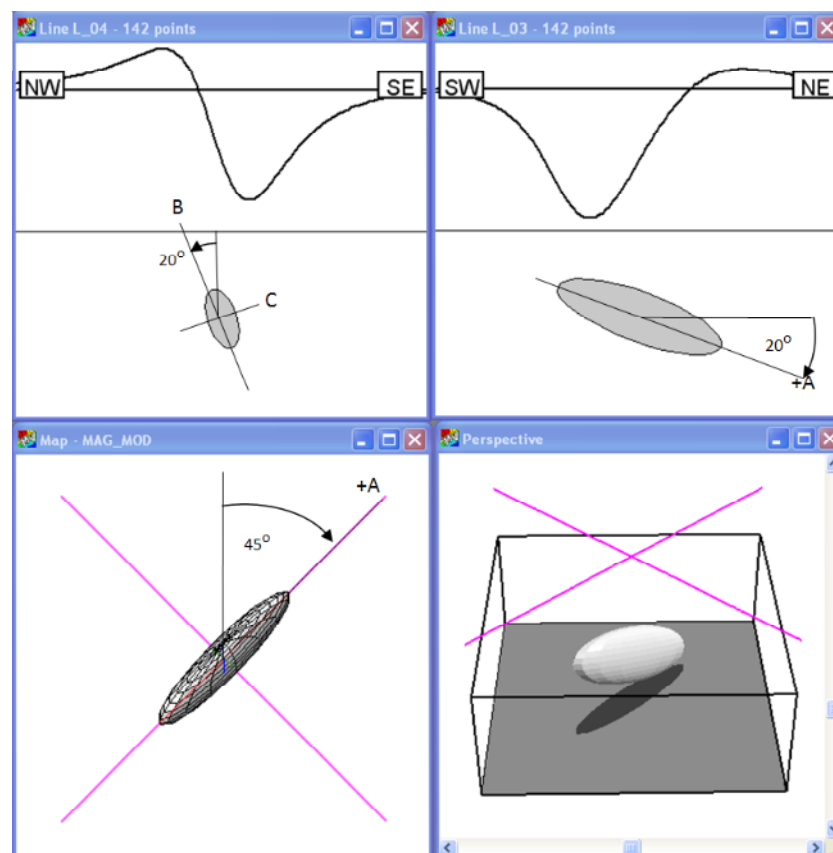


General 3D Ellipsoid

The generalized 3D ellipsoid is one of the most difficult of bodies to visualize and characterize by simple axis and rotation parameters. For this reason a detailed illustration is provided. For additional information on this body, refer to Emerson et al (1985).

The generalized ellipsoid is a complete but flexible body type that approximates each of:

- General ellipsoid.
- Sphere, where all ellipsoid axes are equal
- Prolate ellipsoid. That is, similar in shape to a football, where the ellipse rotates about the long axis and the shorter axes are equal in length
- Oblate ellipsoid. That is, similar in shape to a discus, where the axis of revolution is short, and the two other axes are long and equal in length.



Ellipsoid angles defined on two orthogonal cross sections a map view and 3D perspective view.

The parameters defining all cases of the general ellipsoid body are:

- Location X,Y,Z defines the ellipsoid centre.
- Ellipsoid axes are referred to as A, B and C (see the above figure). Axis A is referred to as the major axis, B as the semi-major or intermediate axis and C as the minor axis. The lengths of each ellipsoid semi-axis define the ellipsoid shape.
- Horizontal azimuth of the +A-axis is measured as the rotation in degrees of the +A axis looking in the down-dip direction. The azimuth is clockwise positive clockwise map north. The A-axis azimuth ranges from 0° to 360°.
- The +A-axis dip is measured in degrees from the horizontal plane such that $0^\circ \leq \text{dip} \leq 90^\circ$.
- The ellipsoid rotation is the anticlockwise angle between the vertical plane along the

A axis and the B-axis while looking down dip. See the above figure for the details. The ellipsoid rotation can range from -90° to 90° .

The following dialog shows the axis parameters for the above figure.

The 'Body Properties' dialog box is shown with the following settings:

- Label name:** Pleistocene
- Density (bg 2.67):** 2.770000
- Susceptibility:** 0.0200000 SI
- Convert Body:** Ellipsoid
- Radio buttons:** Spatial (selected), NRM, Aniso, Pos, UBC
- Coordinates:** X = 500000.0, Y = 6000000.0, Z = 300.0
- Volume m3:** 6283185
- Active:** ☒ **Locked:** ☐ **Visible:** ☒ **Regional:** ☐
- Buttons:** Add Label, Display Properties, Delete, Display
- Associated Channels:** (empty)
- Next Body:** 128 facets
- Buttons:** <, >, Close, Apply, Auto (unchecked)
- A SemiAxis (red):** Length = 300.0, Plunge = 20.0, Azimuth = 45.0
- B SemiAxis (blue):** Length = 100.0, Rotation = 20.0
- C SemiAxis (green):** Length = 50.0

Body properties dialog for the ellipsoid