Coordinate system in InSite seismic processing software

Spatial representation in the 3D visualizer, position of stations and objects and location results in InSite follow the convention North, East, Down (N,E,D). A point in space therefore must be defined by the values of the three coordinates. Vectors, such as the orientation of sensor axes, must be input by the value of the three components of the unit vector (i,j,k), with i being the projection onto the North axis, j being the projection onto the East axis and k the projection of the unit vector onto the vertical axis pointing down.

It is typical to represent the orientation of vectors in space, e.g. orientation of the axes of a sensor, by their Azimuth and Dip. Assuming the convention that Azimuth is the angle from North (ranging from 0° to 360°) and the dip is the angle from the horizontal (-90° to 90°, positive for down-pointing vectors and negative for up-pointing vectors), the coordinates of the unit vector following InSite's convention can be calculated as follows:

- 1st Quadrant: 0°<Azimuth≤90°: unit vector (cos (Azimuth), sin (Azimuth), sin (Dip))
- 2nd Quadrant: 90°<Azimuth≤180°: unit vector (-sin (Azimuth-90), cos (Azimuth-90), sin (Dip))
- 3rd Quadrant: 180°<Azimuth≤270°: unit vector (-cos (Azimuth-180), -sin (Azimuth-180), sin (Dip))
- 4th Quadrant: 270°<Azimuth≤360°: unit vector (sin (Azimuth-270), -cos (Azimuth-270), sin (Dip))