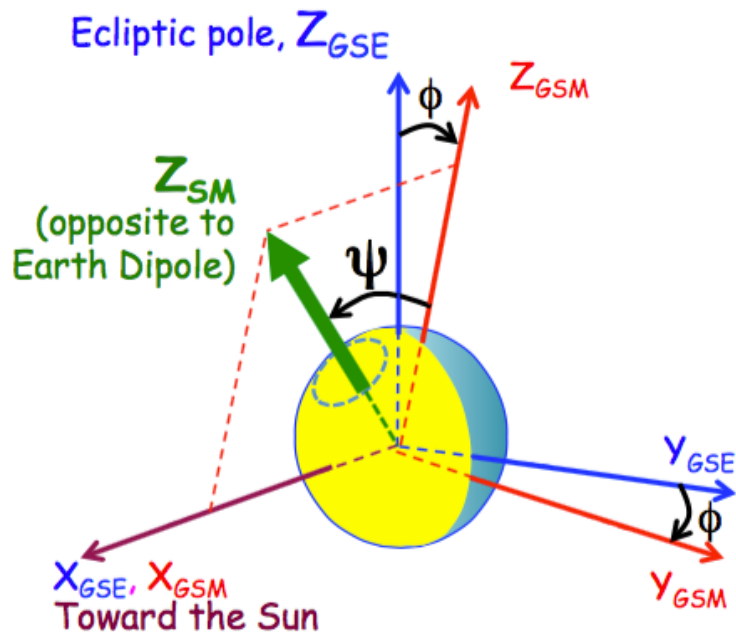


For characterizing the attitude of the Earth Magnetic dipole relatively to the Earth-Sun axis, 2 angles can be used as illustrated in the following figure.



The magnetic moment of the Earth is a vector opposite to the unit vector carrying the  $Z_{SM}$  axis (SM: Solar Magnetic reference frame).

The tilt angle ( $\psi$ ) is the angle the  $Z_{SM}$  (the opposite of the Earth magnetic moment) and  $Z_{GSM}$  directions.

The "roll angle" ( $\phi$ ) is the angle between the projection of the Earth magnetic moment on the  $YZ_{GSE}$  plane and the  $Z_{GSE}$  direction. It is also the angle between the  $XZ_{GSM}$  and the  $XZ_{GSE}$  planes or the  $XY_{GSM}$  and  $XY_{GSE}$  planes.