

Brittle Structural Geology

Lab no. 1. 15/2/2023



STEREOGRAPHIC PROJECTIONS

Representation of structural data by the geometric methods in the previous labs and its application becomes difficult if we have to analyze a large number of measurements. In these labs we introduce the concept of the stereographic projection, which has become widely used by structural geologists during the last 50 years, which provides a simple and quick alternative way to represent three-dimensional data in two dimensions.

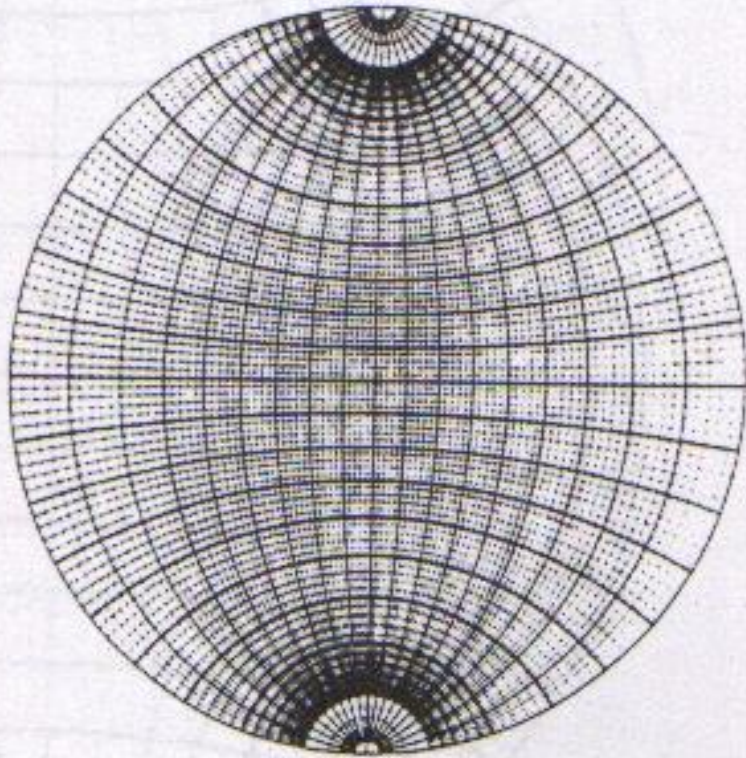
Although

data plotting using a stereographic projection may seem abstract at first, once you are used to it you will find that the methods are powerful and allow you to solve many types of structural problems easily.

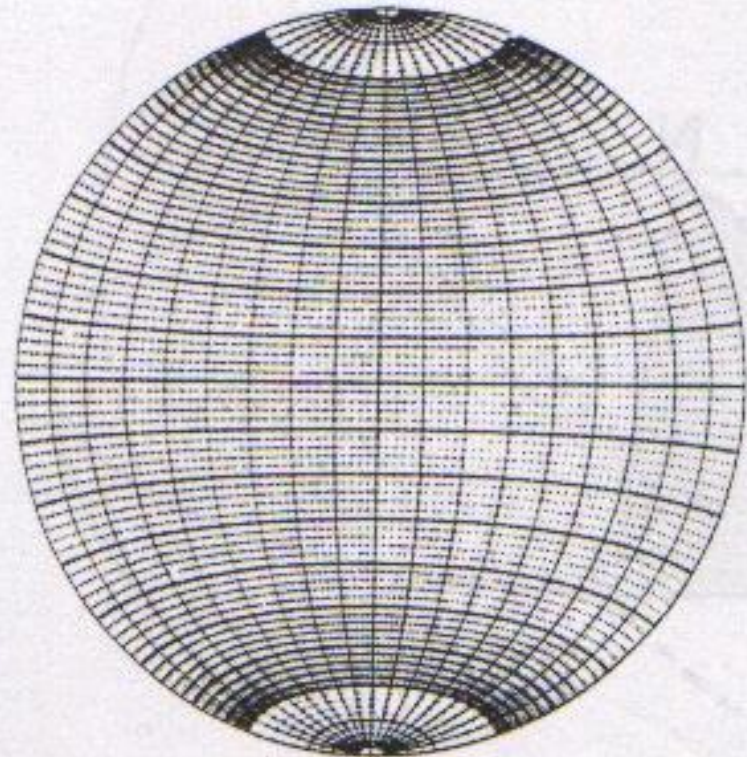
Computers are increasingly being used to plot structural data on stereographic projections, but you will not be able to interpret computer output if you are not adept at plotting data by hand.

Two types of nets are in common use

- *Wulff net: this net uses in crystallographic use, not equal in areas.*
- *Equal area Schmidt net : this net used in structural geology analysis data*



a Stereographic Net



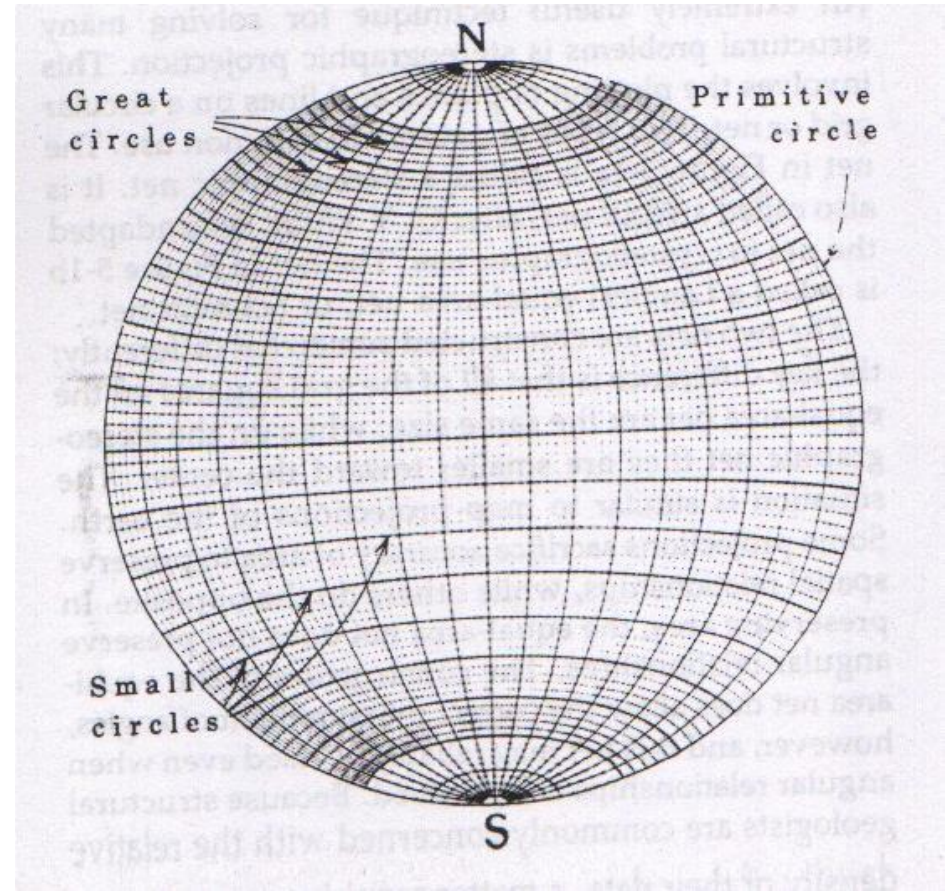
b Equal-Area Net

The equal – area net is arranged like a globe of the earth (North-South lines that are analogous to meridians of longitude, and East-West lines analogous to latitude)

The North-South lines called great circle

East-west lines called small circle

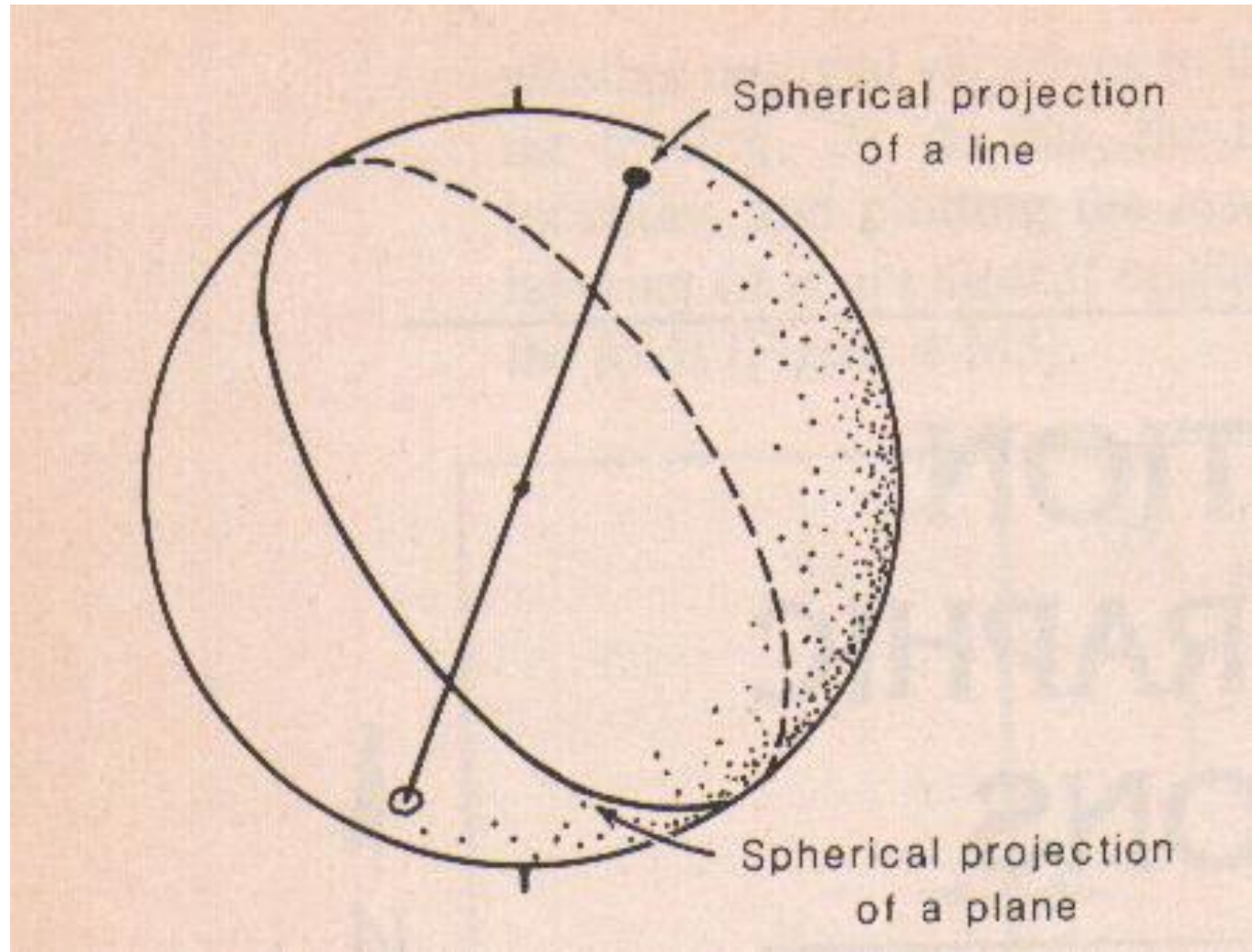
Perimeter of net is called primitive circle



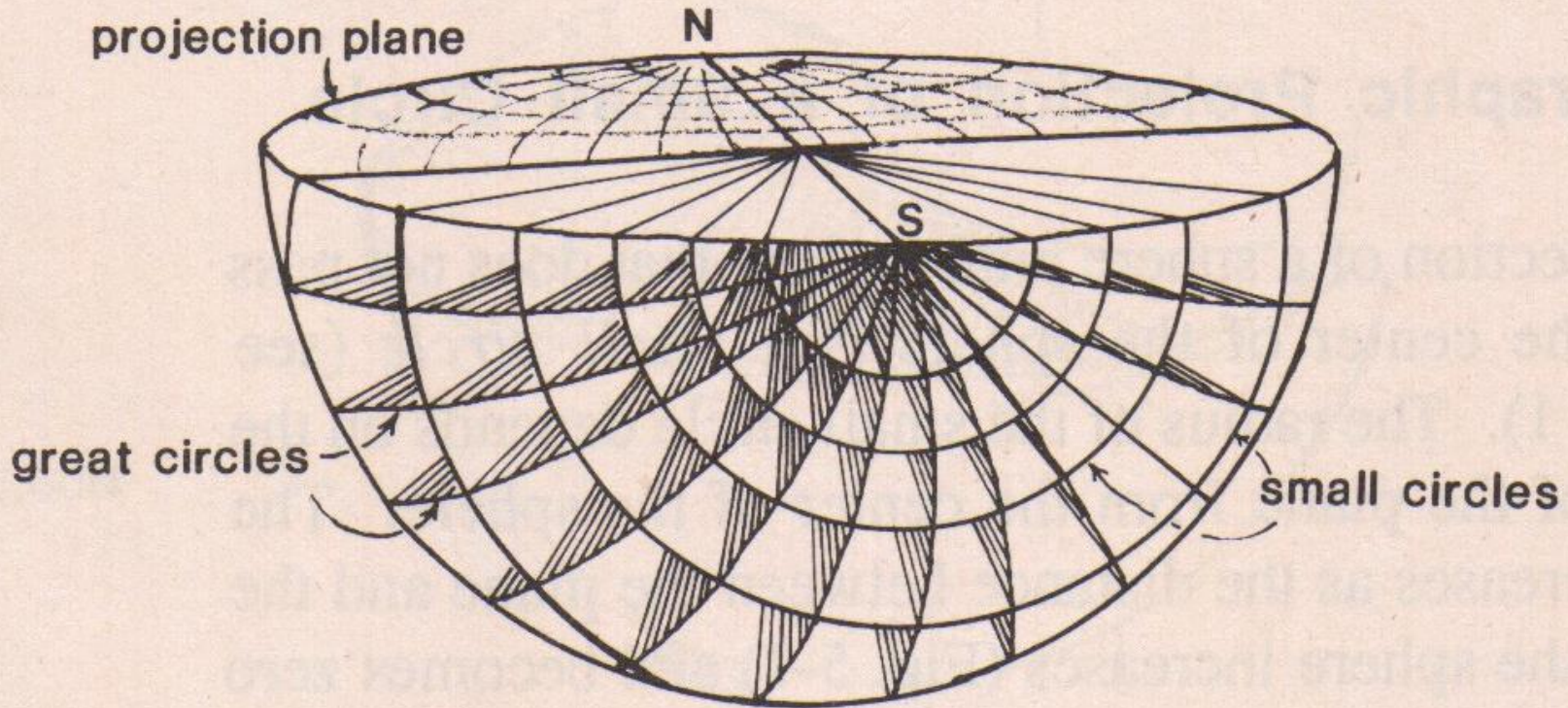
Spherical projections of lines and planes

Any line through the center of the sphere cut the Sphere at two points.

Any plane through the center of the sphere intersects the sphere along a circle.



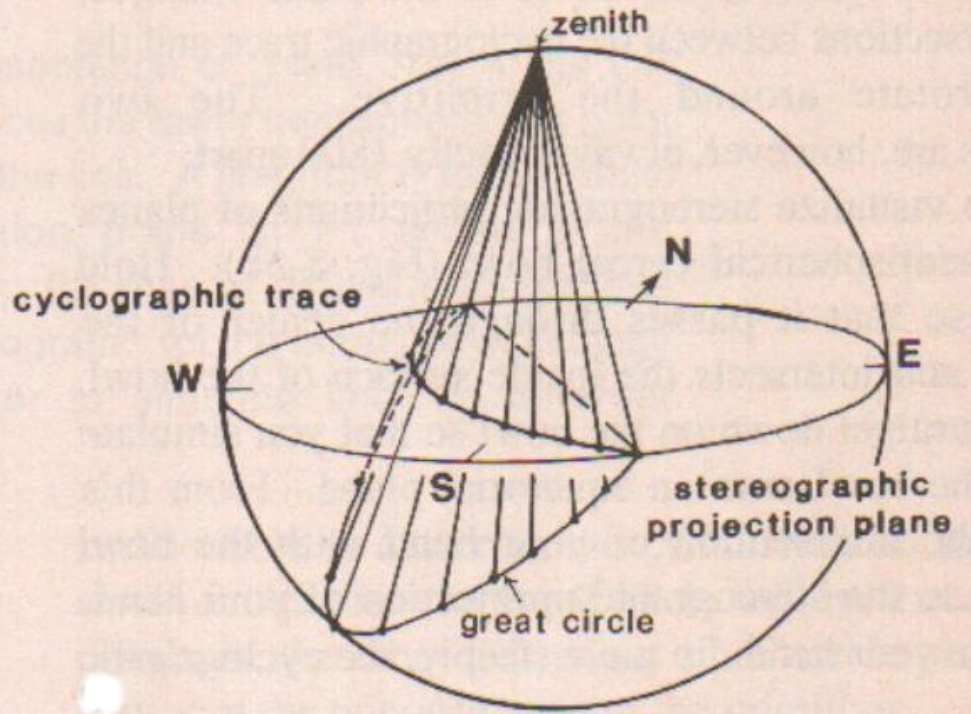
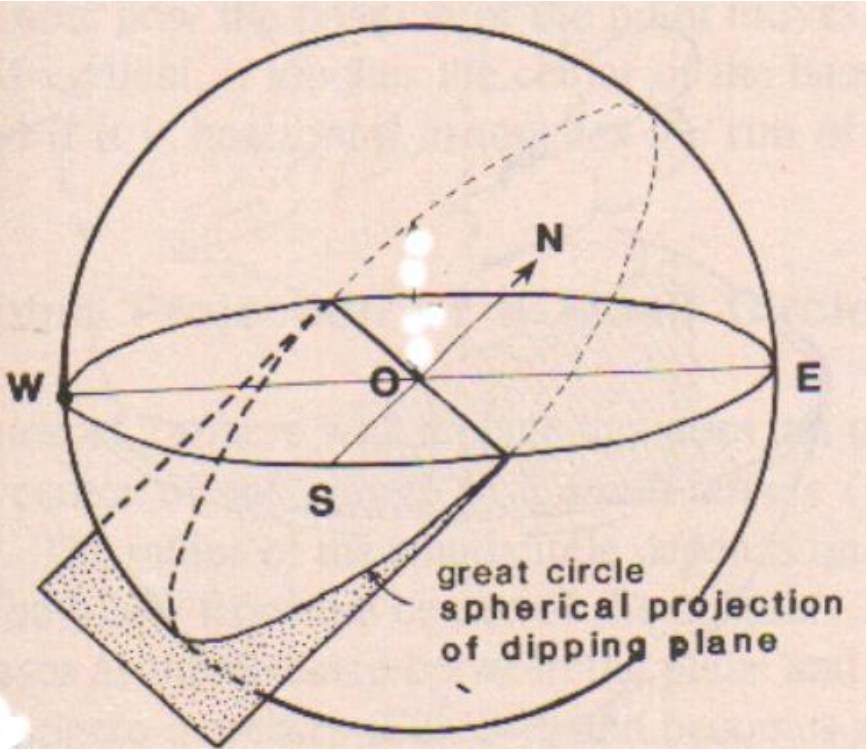
In structural geology the Lower hemisphere is taken in to consideration



Great circle on the stereonet represent dipping planes that all intersect along the north-south axis.

The small circles represent coaxial circular cones.

Stereographic representation of planes (Stereographic projection of the planes)



Plotting Techniques:

•preparing the stereonet and overlay

A): Plotting a Line:

Exc. (1): Represent *following lines* on stereographic net:

1- 233/ 46

2- N48E/ 54

3- 061/ 69

4- 302/88

5- 156/ 90

6- S40W/ 22

7- S90E/02

8- N40W / 38

B): Plotting Planes:

- Strike / dip
- Dip direction/ dip

Exc. (2): Represent *following planes* on stereographic net;

1- N68E /62 NW

2- 038/ 32

3- 353/ 76 SW

4- S78E / 20 NE

5-270/ 44

6- 188/ 18

7- 070/ 71 NW

8- 265/ 88SE