Transit of Venus background

If you had a parallax angle, *p*, for Venus, you could get the distance to Venus, *d*.

Venus

*p*

*d*

Earth

*b*



If you had the distance between Earth and Venus, *d*, you could get the distance between the Earth and the Sun, , (called the Astronomical Unit,) from Kepler’s third law (The ratio of the cube of a planet’s semi-major axis to the square of its period is a constant based on the mass of the sun).

 The periods are well known.

Substituting , this becomes .

If you had the Astronomical Unit, you would be happy.

Around 1677 Edmund Halley observed that you could get a parallax angle for Venus by using the sun

in the place of the background stars shown in the first drawing.

A

2*p*

**B**

As seen from Earth, Venus travels across the face of the sun. These drawings are

not to scale. The paths of Venus across the sun

Observer B sees the top row.

2*p*

observed by A and B are actually less than an apparent-

Venus-diameter apart. The parallax angle 2*p* can be derived from

the times for the transit as measured by observers A and B.

Observer A sees the bottom row.