A given spot moves across the surface of the Sun with a 29 day period.

First astrophysical measurement of a celestial body
Basic Observed Spot Phenomena

• The spots are on the Sun
• Spots move across the Sun w/29 day period
• Annual (seasonal) variation in the tilt of the path of spots across the face of the Sun
• No obvious diurnal variation in spots
## Geocentrism vs Heliocentrism

<table>
<thead>
<tr>
<th>HELIOCENTRIC</th>
<th>GEOCENTRIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sun rotates on axis in 29 days</td>
<td>• Sun rotates on axis in 29 days</td>
</tr>
<tr>
<td>• Diurnal rotation of Earth</td>
<td>• Sun’s rotation axis precesses systematically in one year as Sun traces</td>
</tr>
<tr>
<td>• Annual orbit of Earth about the Sun</td>
<td>out the ecliptic</td>
</tr>
<tr>
<td>• Respective tilts of axes of rotation of the Earth and Sun</td>
<td>• Sun’s rotation axis remains locked to Earth’s orientation over the</td>
</tr>
<tr>
<td></td>
<td>course of a day</td>
</tr>
</tbody>
</table>
Fast-forward to the future......

Monnier, Roettenbacher, Barclay & Harmon (2013)
Zeeman-Doppler imaging

- Doppler Imaging
- Zeeman-Doppler Imaging

Atomic lines

Observational evidence for magnetic fields across the HR diagram, IAUS 259, Nov 5, 2008, Tenerife Berdyugina

Radial magnetic field
Stokes V profile

(P. Petit)