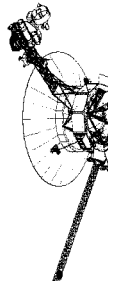
# Voyager loses part of its magnetic connection with our Sun - but not all of it!



Magnetic field studies from Voyager 1, now the most distant object ever launched into space by mankind, have been continuously made since launch in 1977. One of the important topics being investigated is how the interplanetray magnetic field in the distant heliosphere, beyond the orbit of Jupiter, changes in response as the sun rotates every 27 days and as solar activity waxes and wans every 11 years.

At the current distance of the V1 from the sun, 70 AU, the variation of the magnetic field no longer shows the presence of coherent and repetitive 27 day solar variations, actually stretched to 29 days ( the synodic period on V1) because of the heliocentric motion of the spacecraft. But the new studies reveal that during the past 20 years, there has been a discernable variation in the characteristics of the magnetic field correlated with the 11 year period or cycle of solar activity. This refers to changes in the number of sunspots and other related solar phenomena.

The principal change of the strength of the interplanetary magnetic field is that it is roughly inversely proportional to distance from the sun, as the expanding sun's atmospehre, the solar wind plasma, stretches the magnetic field originating on the sun into an ever larger region of space around the sun; this region being called the heliosphere.

But we have found superimposed on this variation the distinct presence of enhanced magnetic field strengths observed in 1979-80 and again in 1990-91, closely following and reflecting the well known 11 year period of solar activity. The magnetic fields are strongest when the activity is highest.

We are predicting an average field strength of 0.06 nanoTesla in the year 2000 when the V1 spacecraft will be at 76 AU from the sun. At that time the radio signals from the spacecraft will take 10.5 hours to travel to the Earth.

At the present time, V1 is measuring extremely weak magnetic fields, averaging less than 0.05 nanoTeslas or less than 1% of the interplanetary magnetic field strength at the distance of Earth from the Sun. For comparison with Earth's magnetic field at the equator, its strength is 30,000 nanoTeslas.

**Submitted by the MAG PI, Norman Ness**