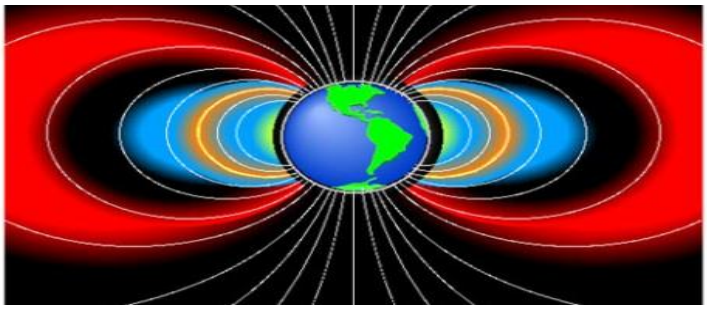
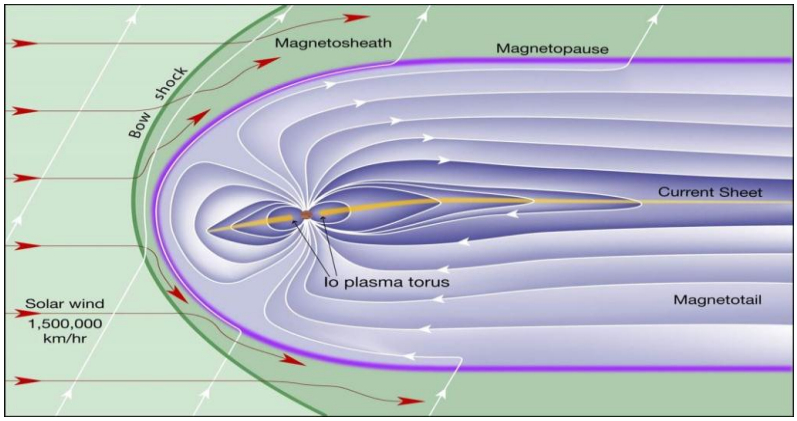
EARTH'S ATMOSPHERE: RADIATION BELTS, IONOSPHERE AND EXOSPHERE



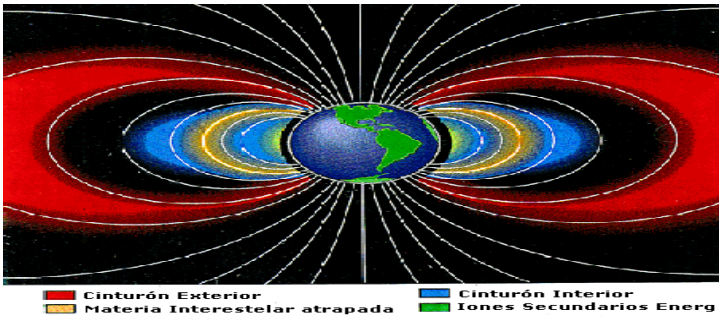
Among the 50,000 km (31,000 miles) and 20,000 km (12,000 miles) of distance from the surface of Earth is "the outer Van Allen radiation belt" which is a dynamic layer composed mainly of highly energized electrons, but also ionized particles of helium and oxygen which come from both collisions in the magnetopause or particles that try to escape from Earth's gravity through the magnetosphere.

This layer moves according to the rotation of the earth, so that in the outer parts particles can even shoot out following the path of the magnetotail. This layer can dramatically increase or decrease as a result of solar storms and turbulence or changes in the geomagnetic field.



Among the 18,000 km (11,000 miles) and 20,000 km (12,500 miles) from the Earth's surface, it is formed a a low frequency gap which scatters particles in angular direction coming from turbulence caused in the ionosphere.

Among the 18,000 km (11,000 miles) and 6,000 km (4,000 miles) the "inner Van Allen radiation belt" is formed, which is much smaller but with higher density of electrons and ions than outer belt but with a moderate energy (in places where solar activity is greater it can even reach of 200 km altitude). These high concentrations of energized protons and electrons sometimes exceed 100 MeV and are trapped by magnetic fields stronger than the "outer radiation belt"



These belts will eventually be grouped by densities and these densities have their own determined flow speed.

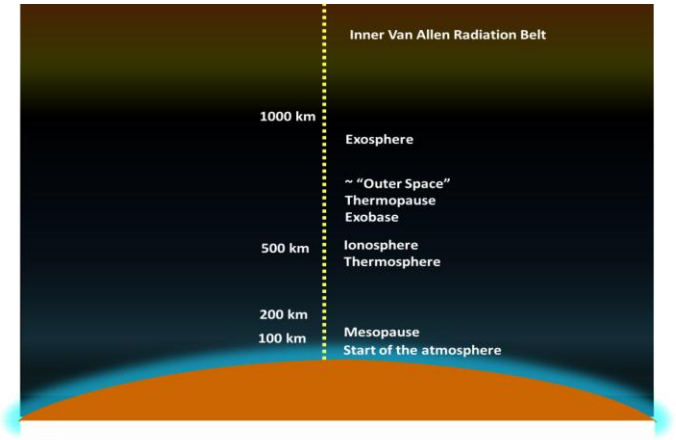
For example, the “inner belt” consists mostly of highly energetic protons with decayed neutrons emitting high energy ”gamma rays” which behave according to the Earth’s electromagnetic field, while the “outer radiation belt” is mainly composed of highly energized electrons.

Although they behave as the Earth’s electromagnetic field moving in the direction of either pole with chaotic movements, they may eventually follow the path length of the magneto tail losing energy.

From the end of the “inner radiation Van Allen belt” to 1000 km (600 miles) of altitude, it can be identified the “exosphere” composed of particles of light gases such as hydrogen, helium, carbon dioxide and ionized oxygen which begin to be perceived.

In the “exosphere” layer is where most artificial satellites are, so its location must be monitored constantly in altitude to ensure its orbit.

Particles in the “exosphere” reach temperatures up to 1500 ° C, but they are hundreds of miles apart, so that the heat is almost imperceptible, there is little collision between them and interact according to the electromagnetic field of the Earth with free paths, so that some energized particles try to escape the Earth’s gravity.



Source: http://www.artinaid.com/2013/04/earths-atmosphere-radiation-belts-ionosphere-and-exosphere/