

## II Space Systems and Anti-Satellite Capabilities

### II 1. Space Systems

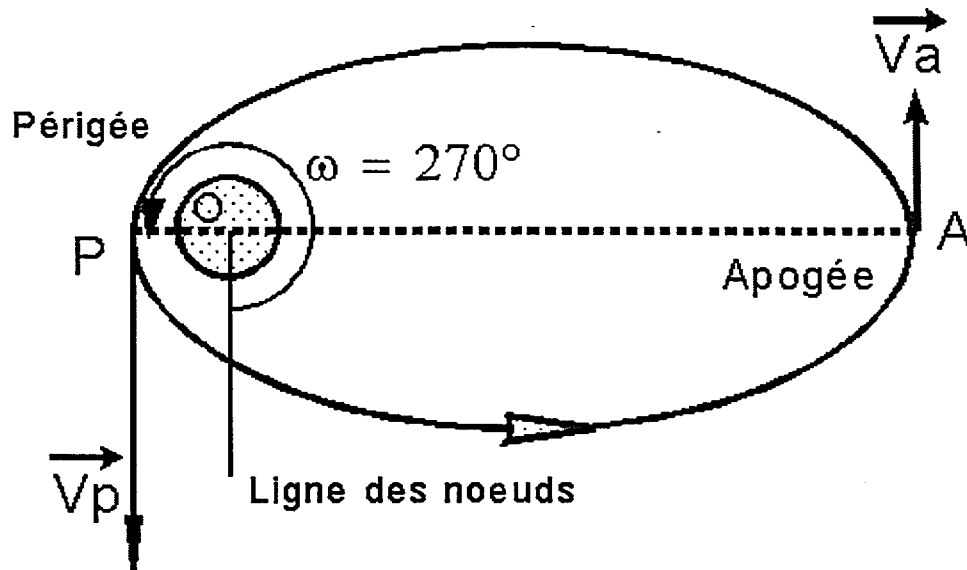
Satellites vary greatly in their architecture. For the purpose of this analysis satellites are divided into the following functions, namely: communications, remote sensing, meteorological, navigational, and military satellites. These systems have different attributes, which may affect the manner in which they may legitimately be neutralized.

#### II 1.1 Communications Satellite Systems

The vast majority of telecommunication satellites are located in geostationary orbit at an altitude of 36,000 kilometres above the equator. The International Telecommunication Union (ITU) regulates the geostationary orbit ensuring separation between satellites and establishes rights against harmful interference in the allocation of the radio frequency spectrum<sup>40</sup>. The later ITU criterion applies to all satellites for their uplinks and downlinks. However the ITU management of orbital coordinates is limited to the satellites in geostationary orbit. The concept of orbital coordinates only applies to satellites that are in geostationary orbit, as other satellites do not have fixed coordinates, but rather orbital parameters.

Not all communications satellites operate in geostationary orbit. For example, the Russians have developed a highly elliptical Molnya Orbit for their telecommunications satellite needs. This is due to the fact that a large part of the country is too far north for the ground trace of geostationary telecommunication satellites to be effective.

MOLNYA ORBIT<sup>41</sup>



<sup>40</sup> It is interesting to note that ITU regulations define a satellite as "a body for which the motion around another body is determined primarily and permanently by the force of attraction (Regulations S1.179 and S1.284).

<sup>41</sup> <http://artemis.univ-mrs.fr/cybermecca/Formcont/mecaspa/EXERCICE/SATELLIT/MOLNYA/MOLNYA.HTM>.