Solar Corona and Space Weather

*Philippe Lamy[1]

1.Laboratoire Astrophysique de Marseille

It is now well established that the activity in the solar corona plays a major role in the processes at the origin of space weather effects in the heliosphere. The almost uninterrupted observations by the LASCO coronagraph onboard SOHO since January 1996 have allowed an unprecedented view of the coronal activity over almost two solar cycles 23 and 24 which reflects to a larger extent the magnetic activity of the Sun. I will report on the evolution of the corona and its large scale structure through various parameters, such as its radiometry and its three-dimensional electron density. The temporal variations will be compared with standard solar indices and various proxies of solar activity in order to identify the driving mechanisms that control the activity of the corona. Coronal mass ejections (CMEs) are strongly controlling space weather and the ARTEMIS-II catalog based on their automatic detection on high-quality calibrated synoptic maps of the corona allows performing an unbiased statistical analysis of their properties and investigate how they evolve with solar activity. I will present the results for occurrence and mass rates, waiting times, position angle, angular width, kinetic energy, and mass flux first globally and then separately for the two solar cycles 23 and 24 emphasizing the differences. I will further compare the statistical properties of CMEs with those of the standard indices of solar activity as well as those of their potential progenitors, flares and eruptive prominences.

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