THE CALM DAYS IN THE TRELEW MAGNETIC OBSERVATORY

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The magnetic field produced by the external currents system represents one of the effects due to the interaction between the Earth Magnetic field produced in the geodynamo and the photonic and particle solar radiations . The solar cycle and the variations on these solar radiations parameters are the responsible of the variations and modulations on the field recorded at the Permanents Observatories, and Repeat and Semi-permanents Stations, which are auxiliary in the magnetic surveys. At present the magnetic field perturbations are characterized by means of activity indices, which can be globally or sectorized according the sources of these perturbations and the location of the observatories. One of the most important goals of these indices is the determination of the most quiet days of the month. With this respect differents programs for the determination of the ks activity index (for each observatory) and for the determination of the global kp index were proposed, and starting from the last, the five most quiet days of the month are reported by the International Asociation of Geomagnetis and Aeronomy (IAGA). The goal of this new method is to can dispose of the real amount of calms days existing in a month, which can be none, or more than one, reaching some times more than twenty per month. After the evaluation of the results it is observed that the five most quiet days of the month maintains a residue due to the modulating activity of solar cycle, therefore are not in the literal sense quiets days. In the present work another way for the determination of quiet days based on the digital record magnetograms of each observatory recording each 1 minute is proposed. In this method an activity index that allows to evaluate the temporal evolution of magnetic activity through the solar cycle and to establish the more quiet activity levels for each observatory, and then to compare the results with the quiets days reported by IAGA, is created . The methodology consists in apply a movile window of 1 hour wide, each 1 minute, and then to calculate the sum of the deviations of the mean hourly value in the central minute of the window for the 1440 minutes corresponding to each day in Solar Local Time. The obtained sum is a measure of the perturbation corresponding to each day of digital record and to each observatory. The acumulated daily sum constitutes a new local index of daily magnetic activity recorded at Trelew Magnetic Observatory. The local index ranges from 200 nT, corresponding to the more calms days, to 17475 nT, corresponding to the more disturbed day found in the studied period 1993-2008. For calms days this index ranges from 200 nT to 700 nT. Their evolution through solar cycle shows a great sensibility in the adoption of quiet days versus disturbed days. The method is applied to Trelew Magnetic Observatory (Lat: 43º 16.1' S; Long.: 65º 22.9' W . Argentina) for digital recods from 1993.6 to 2009.0. The results shows along the solar cycle 23, according this new method there are many months that have more than the five calms days reported by global indices as the montly five more Q days, reaching twenty calms days per month, especially in years 2007 and 2008 corresponding to solar minimun, and there are some months that shows none calm day, in years of solar maximun. The solar daily variations amplitudes are determinated for all calm days whose perturbation is lower than 700nT . A comparison with a Semipermanent Station in Zonda Geophysical Observatory (Lat.: 31° 32' 43"S; Long.: 68° 41' 03"W. Argentina) and Las Acacias (Lat.: 35º 00.5' S; Long.: 57º 41.65' W. Argentina) was made. We conclude that this system is more adecuate to study the Sq than take the monthly Q days for these particular Magnetic and Repeat Station Observatories.

Q days, magnetic indices, daily variation

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