Solar, Geomagnetic and Cosmic Ray Intensity Changes, Preceding the Cyclone Appearances around Mexico.

J. Pérez-Peraza (1), S. Kavlakov (2), A. Gallegos-Cruz (3), E. Azpra-Romero (4), O. Delgado-Delgado (4), F. Villicaña-Cruz (4).

(1) Instituto de Geofísica, UNAM, C.U., Coyoacán, 04510, México, D.F., MÉXICO

(perperaz@igeofcu.unam.mx / Phone: 52-55-56224117)

(2) Bulgarian Academy of Sciences, Galileo Galilei Str. 17/B, 1113, Sofia, BULGARIA

(skavlakov@earthlink.net)

(3) UPIICSA, I.P.N., Depto. de Ciencias Básicas, Té 950, Iztacalco, 08400, México D.F., MÉXICO

(4) Centro de la Atmósfera, UNAM, C.U., Coyoacán, 04510, México, D.F., MÉXICO.

Abstract

Recently it was shown, that there exist specific changes in the cosmic ray intensity and some solar and geomagnetic parameters during the days, preceding the hurricane appearances over the North Atlantic Ocean. To understand better these phenomena, data were elaborated for all hurricanes born not only over the Atlantic but also over the Pacific waters in the last 55 years and hit the Mexican borders. As basic hurricane parameters the maximum rotational velocity and the estimated total energy were used. To avoid any interference all hurricanes, overlapping the preceding ones with more than 20 days were not included. Then the behaviour of the Cosmic Ray (CR) intensity, the Sunspot (SS) numbers, and the geomagnetic parameters (AP) and (KP) in 35 days prior and 20 days after of the cyclone start were investigated. The CR, SS, AP and KP showed much more intensive disturbances in the periods preceding and following the hurricane appearance. For SS this disturbance gradually increase with the hurricane strength. A characteristic peak in the CR intensity appears before the hurricane start. But it place varies between 5 and 20 days before that start. Such a peak in the SS is statistically more stable. For major hurricanes it appears 7-9 days in advance. The AP and the KP show similar changes.