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Structure and Shape of the Solar Corona August 11, 1999

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The solar corona August 11 1999 was observed close to the maximal phase of its 11-year SA cycle and had the maximal shape. It consists of numerous thin rays, which have mainly radial orientation. The corona also contains a considerable number of big and bright prominences. One notes that the angle of divergence of the East-fan of rays is much larger than the West-fan. This gives evidence that there is a significant E/W asymmetry of the solar corona. The brightness distribution of the solar corona is close to spherical-symmetric. Only near the South pole is there a less bright region which is connected with the existence of the polar coronal hole here. This fact and also some other circumstances show that the solar corona has noticeable N/S asymmetry. The high-latitude rays of the N-hemisphere (especially in the NE sector) are inclined in the direction of the N-pole, and the high-latitude rays in the SW-sector of the south hemisphere are inclined in the direction of the solar equator. All this shows that the N-hemisphere is more active than the S-one. It means that the N-hemisphere is close to its maximal shape of the development. We note that the sunspot activity in the N-hemisphere for all the branch of rise of SA, including 1999 ($\Sigma W_N/\Sigma W_S = 1.15$), is considerably higher than for the S-one. According to our forecast (Ivanchuk, Babiy: 1998, Inform. Bull. UAA, 1998, No. 12, p. 30) the 23^{rd} cycle is characterized by dominating spot activity and threefold polarity reversing in the S-hemisphere. It follows that the maximum of the present 23^{rd} cycle of the SA will take place in the N-hemisphere in the middle of 2000 and in the S-one the maximum of the solar activity (SA) will probably appear in the middle of 2001. The interesting peculiarity of the solar corona August 11 1999 is the existence of the saber-like thin double ray on the NE-limb (at $PA = 50^o$). It is close to a peculiar center of "repulsion", which is observed for the fan of rays of the E-limb. Similar rays existed also in certain coronas over active regions of the Sun, and were connected with the phenomena of the transient of the coronal plasma of the "ray-type". Therefore, this ray and sharp divergence of the rays on the E corona are probably connected with the existence of the ejection. In the region of the NW-quadrant and near the W-equator on the best images of the corona the sharp trans-equatorial arc is detected. We believe that this structure is connected with development of the coronal mass ejection (CME) detected by the cosmic coronograph C2 of Lasco SoHO August 11/12, 1999. The CME velocity in the inner corona was very low (12 km s^{-1}) and in the outer corona the CME velocity was moderate (170-200 km s^{-1}). Comparison of the August 11, 1999 solar corona structure with the model of the corona magnetic field are similar.