

## 23<sup>rd</sup> CYCLE OF SOLAR ACTIVITY IN THE LIGHT OF 34 YEARS OF CRACOW OBSERVATIONS OF SOLAR RADIO EMISSION

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Systematic daily observations of solar radio emission were started at the Fort Skała Observatory on 1st October 1957. The observations were made at the frequency of 810 MHz first with a 5m radio telescope - and since 1964 with a 7m one; at present they comprise already almost 70 thousand hours of observations (Michalec 1991). During that period there were two longer interruptions in the observations: from 23 September 1963 to 2 February 1964 - due to transferring the radio telescope's antenna from the top of the Fort to a new site, and from 6 November 1973 to 11 March 1974 - connected with the reconstruction of the receiver. Other, fortunately short, interruptions in the course of observations had no influence on the homogeneity of the series.

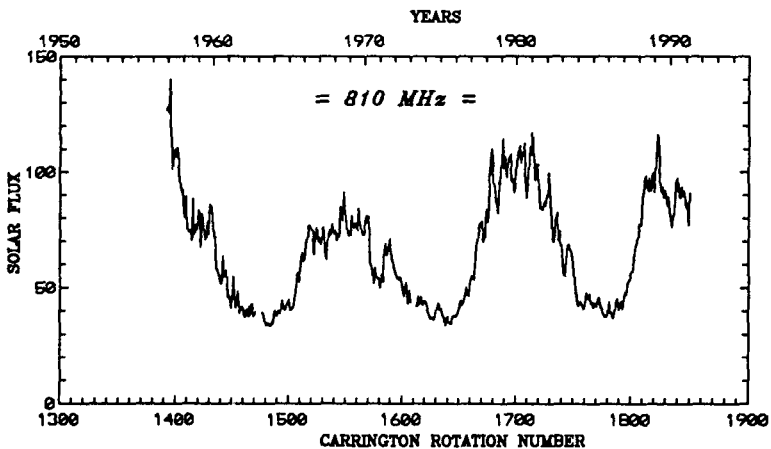


Fig.1 represents the mean values of solar radio emission in

the individual synodical rotations covering the period of 34 years of Cracow observations. In this diagrams the 11-year cycle of solar activity is distinctly pronounced.

Now, let us draw our attention to the secondary maxima appearing in the rotations: 1430 (year ~ 1960.6), 1589 (year ~ 1972.5), and 1746 (year ~ 1984.2) at the intervals of 159 - 157 rotations. If we accept the mean value 158, as the period of recurring secondary maxima, then the next expected secondary maximum will occur in the rotation no. 1904, i.e. in the year 1996.0.

The occurrence of secondary maxima was pointed out by Mc Intosh (Wilson 1988), on the basis of the Canadian observations of solar radio emission - on the 10.7 cm wave-length (2.8 GHz), started 10 years earlier than the Cracow observations.

These secondary maxima - if to accept the idea - constitute a reflection of the violent process of remagnetization of the old cycle's solar spots and of the appearance at high heliographic latitudes of the first spots belonging already to the new cycle of activity (Vitinsky et al. 1986)

The secondary maxima appear about 1.5 year after the phase of maximum activity and 3.5 years before the minimum (Michalec 1989). If this hypothesis were true, then on its base it could be forecasted that the minimum of the 22/23 cycle of solar activity will fall on about 1998.5 and the maximum of 23rd cycle on the year 2002.5.

The determination of fundamental moments in the 11-year cycles of solar activity, such as the minimum or maximum (Withbroe 1989) is extremely important, if only for purposes of planning long-term cosmic flights, manned or unmanned (Sky & Telescope 1990).

#### ACKNOWLEDGEMENTS

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establishing an observational series long enough to make those far-reaching conclusions plausible.

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