

Main aim of this work was measurement of a floating potential fluctuations in the cylindrical magnetron in classical configuration in neon. Two Langmuir probes were used for measurement of wave vector. The following values were measured: pressure  $p$  in range 1-7 Pa, magnetic induction  $B$  in range 10-40 mT, discharge current  $I$  in range 5-100 mA, discharge voltage  $U$  and floating potential  $U_f$ . Fluctuations were described by dependencies of power spectral density on frequency  $S(f)$  and by histograms  $S(k,f)$ , where  $k$  is wave vector. Several discharge modes were observed in the magnetron. These are characterized by different values of discharge voltage, electric field in positive column, magnitude of the floating potential etc. The discharge conditions, where peaks were observed in spectra, were determined. Only one peak with frequency in range 4-16 kHz was mostly observed. Most of these peaks had zero wave vector in histogram  $S(k,f)$ , i.e. the floating potential synchronously oscillated in the whole discharge area. For some discharge conditions histograms with non-zero wave vector for noise background were observed.