

# OSCILLATION OF SOLAR RADIO EMISSION AT CORONAL ACOUSTIC CUT-OFF FREQUENCY

T. Zaqarashvili\*, O. S. Pylaev<sup>†</sup>, A. I. Brazhenko<sup>†</sup>, V. N. Melnik<sup>‡</sup>,  
and A. Hanslmeier\*

## Abstract

Recent SECCHI COR2 observations onboard STEREO-A spacecraft detected density structures at the distance of 2.5–15  $R_0$  (Solar radii) propagating with a periodicity of about 90 minutes. The observations showed that the density structures are probably formed in the lower corona. We used the large Ukrainian radio telescope URAN-2 to observe type IV radio burst at the frequency range of 8–32 MHz during the time interval of 08:15–11:00 UT on 1 August 2011. Radio emission at this frequency range is originated at the heights of 1.1–2.5  $R_0$  according to different density models of the solar corona. A Morlet wavelet analysis showed the periodicity of 80 min in radio emission intensity at all frequencies, which indicates a quasi-periodic variation of coronal density at all heights. The observed periodicity corresponds to the acoustic cut-off frequency of stratified corona with a temperature of 1 MK. We suggest that continuous perturbations of the coronal base in a form of jets/explosive events generate acoustic pulses, which propagate upwards and leave the wake behind oscillating at the coronal cut-off frequency. This wake may transform into recurrent shocks due to the density decrease with height, which leads to the observed periodicity in the radio emission.

---

\* *Institute of Physics, University of Graz, Graz, Austria*

<sup>†</sup> *Institute of Geophysics, Poltava Gravimetric Observatory, Poltava, Ukraine*

<sup>‡</sup> *Institute of Radio Astronomy, National Academy of Sciences of the Ukraine, Kharkov, Ukraine*

