

## Amazing type of RFIs recorded by the UTR-2 radio telescope

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Radio frequency interferences (RFIs) at decameter wavelengths are very various, both artificial and natural. There are identified and non-identified sources of such interferences. Unfortunately, they contaminate radio astronomy records. Technology development inevitably treads on radio astronomy tail more and more. Because of continuous growth of the RFI footprints in radio data the analysis of interference properties (concerning characteristic periodicity of their occurrence, intensity, frequency-time features and so on) is impossible to avoid. The RFI problem became ordinary for all radio astronomy observatories, and the UTR-2 (Ukrainian T-shaped radio telescope, near Kharkov; see S.Ya. Braude, A.V. Megn, B.P. Ryabov, et al., 1978, *Ap&SS*, **54**, pp. 3-36) is not an exception.

Recently we have provided the deep monitoring of frequent RFIs within 8-32 MHz in summer to study their nature and peculiarity. Their registrations were carried out at the time of solar emission observations in summer that lasted three months, each day about three hours before and after noon. Among different types of RFI our attention has been attracted by events with interesting morphology (Figure 1a). At frequency-time spectrograms they look like spikelets. They lasted up to several tens seconds, their frequency band may be up to 15 MHz. The RFI spectra have an amazing fine structure, where their fragments develop in time and frequency. Moreover, their frequency drift can be both positive and negative. We have noticed that as a rule, the RFI emission penetrated through the West arm of the telescope, and the arm locates near a highway. However, sometimes there were cases received from the South arm. Recall that the UTR-2 telescope consists of three arms (North, South and West). Although the RFI appearance is random in time, the “weekly cycle” in the RFI behavior have been discovered (Figure 1b). In particular, the troubles occurred most often in Monday and Friday, before noon. They arise singly (frequently) or two together (rarer) like mirror twins. We assume that origins of these RFIs are a specific system of car ignition.

The results indicate probable influence anthropogenic activity to the radio astronomy low-frequency records. The analysis is useful for planning future radio astronomy experiments.

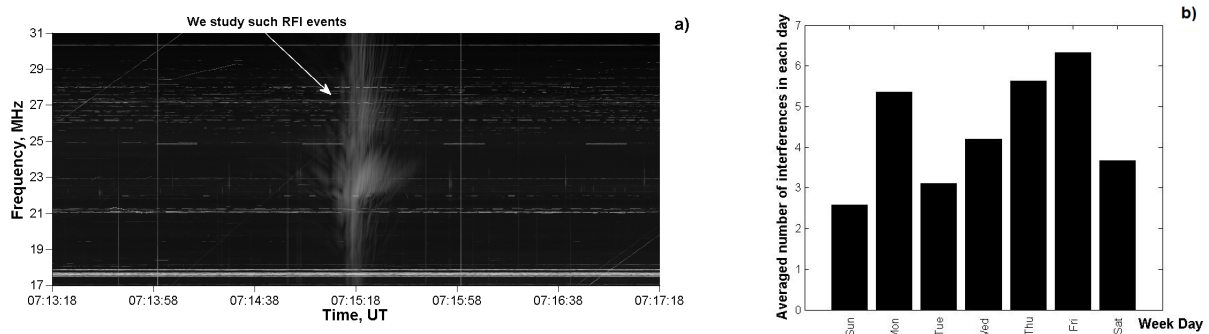


Figure 1: a) Example of amazing interferences recorded by the West arm of UTR-2 at 23 June of 2013; b) Histogram of RFIs (only spikelets) occurrence in dependence of weekday showing so-called “weekly cycle”.