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Type II kilometric radio emissions: A complete list of events observed with TNR and analysis of associated shock waves

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In the present work we build a database of low frequency radio events by means of the analysis of all dynamic spectra of the TNR instrument, in the Wind/WAVES mission from NASA, extending a database built in a previous work.

The list encompasses the years 1994-2021, including more than two full solar cycles.

In this database also, we interrelate the detection of kilometric Type II (kmTII) radio emissions with interplanetary structures such as shock waves and ICMEs. We found a total of 320 events, out of which 136 have not been cataloged before. On the other hand, for 121 shock waves that could be associated with these radiofrequency events, we analyze their physical characteristics and compare them to those of the shock waves not associated with the radio events. The goal is to find which characteristics favor the production of kmTII radio waves, and what are the in-situ differences between them.

The results show that shock waves associated with these radio waves are faster, produce greater changes in density, in magnetic field, and specially changes in the plasma beta due to the type of shock wave.