## Software defined Radio in Radio Astronomy; Limits and Application in RFI detection

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In this paper we present an overview of Software Defined Radio (SDR) application in a single dish Radio Astronomy observatory. Different SDR hardware is investigated and tested towards usage especially for RFI detection. In a first step two kinds of ultra-cheap DVB-T (Digital Video Broadcast – Terrestrial) sticks with USB interface and appropriate software the possibility of spectrometry and demodulation of unwanted signals in the IF of our radio astronomy receiver systems where investigated. Due to the restricted bandwidth of 3.2 MHz and limited RF quality these units are not suited for high resolution spectroscopy. Extensive measurements are shown to demonstrate possibilities and restrictions of the hardware. In a second step more sophisticated (and expensive) hardware was investigated for broadband spectral detection. Two different units with bandwidths of 20 MHz and 1.5 GHz have been used to instantaneously acquire the complete frequency range of our standard IF up to 1 GHz bandwidth. Finally a complete RFI monitoring and detection system is presented which enables us to sample 0-1 GHz IF and identify single spectral lines via a background frequency occupation database. In addition to this four SDR channels 3.2 MHz bandwidth each enable detection and demodulation of specific signals in the band.

Lab measurements of the investigated and final hardware as well as telescope measurements with the final system complete the presentation of this new type of RFI detection and demodulation system.