

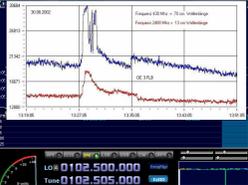
The SRWD project

The radio astronomical IAP project supernova radio wave detector and analyzer (SRWDA) aims to detect and analyze radio signals from supernovas. At the base station a set of antennas, which gives also direction information of the signals, is aimed to be connected to a computer which acts as Software Defined Radio (SDR). Afterwards an analyzing program is aimed to be installed.

Later the detectors are planned to be installed on satellites to improve the resolution and to suppress disturbing signals from earth stations.

Master Thesis

Initial Prototype for a base station for supernova radio wave detector and analyzer (SRWDA)

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|  |  |  | External I/O DLL |  | I |  |
|  |  |  | | | Q | |
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| System of 4 antennas to get directional information http://www.amazon.de/Antenne-DVB-T-Stick-mobile-Ger%C3%A4te/dp/B0049TM2E0/ref=lh_ni_t_mi?ie=UTF8&psc=1&smid=A3CNOI05LJVNHG | Coaxial adapter for each antenna http://www.amazon.de/Wentronic-Koaxial-Adapter-0-1m/dp/B003VVPBBS/ref=lh_ni_t_mi?ie=UTF8&psc=1&smid=A11HOTMS12DU4AQ | DAB+ USB Stick for each antenna http://www.amazon.de/Terratec-ran-T-Stick-DVB-T-schwarz/dp/B007EB995U/ref=lh_ni_t_mi?ie=UTF8&psc=1&smid=A3QJEZPA3Z32RH | To connect the 4 antenna array correctly to the HSDR program | The free software defined radio HSDR | I/Q interface (normally to soundcard) | SRWDA Analyzer Analysis software package |

Detailed description and working plan

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|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 weeks -> Chapter 1 of Master Thesis | Literature research (radio astronomy, SDR) and specification of master thesis |
| 4 weeks -> Chapter 2 of Master Thesis | Installing the development environment: Visual C++ 2008 Express with qt 4.7 (1 week) Initial installation of HSDR with one antenna (ExtIO is the free program zadeg.exe) and introductory learning of HSDR program package (1 week) Short introduction to winrad open source program code to get an understanding of the more complex HSDR code (1 week) Introduction to communication technology (e.g. base band, mixing, I/Q signal) (1 week) |
| 4 weeks -> Chapter 3 of Master Thesis | Migrating existing External I/O DLL ExtIO_Demo.dll from www.hdsdr.de , which is suitable for one antenna to a external IO DLL which is suitable for the antenna array Testing the ExtIO_Array.dll with the four antennas and HSDR |
| 1 week -> Chapter 4 of Master Thesis | Determination of Requirements for SRWDA Analyzer (in cooperation with IAP supervisor) |
| 9 weeks -> Chapter 5 of Master Thesis | Design and Implementation of SRWDA Analyzer |
| 2 weeks -> Chapter 6 of Master Thesis | Test of the system with moving sending objects (a sender from a moving car) |
| 4 weeks | Final writing and correction |
| Sum: 26 weeks (= 6 months) | |

Keywords:

Radio Astronomy, Software Designed Radio, Communication Technology, Visual C++, qt

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