An Overview of the PolSARpro v2.0 Software. The Educational Toolbox for Polarimetric and Interferometric Polarimetric SAR Data Processing.

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Abstract

The PolSARpro v2.0 software was developed under contract to ESA (Development of a Polarimetric SAR Image Analysis Tool, ESAESRIN Contract n° 17863/03/ILG) where the initiative was a direct result of recommendations made during the Workshop on Applications of SAR Polarimetry and Polarimetric Interferometry (POLINSAR 2003) held in January 2003 at ESRIN, Frascati, Italy.

The main objective of this project was to provide an Educational Software that offers a tool for self–education in the field of Polarimetric SAR data analysis at University level and a comprehensive suite of functions for the scientific exploitation of fully and partially polarimetric multi–data sets and the development of applications for such data.

The PolSARpro v2.0 Software establishes a foundation for the exploitation of Polarimetric techniques for scientific developments and stimulates research and applications developments using PolSAR and PolInSAR data.

The PolSARpro V2.0 Software proposes today a great collection of well–established algorithms and tools designed to handle and convert polarimetric data from a range of polarimetric Airborne Sensors (AIRSAR, Convair, EMISAR, ESAR, PISAR, RAMSES) and from a range of past, actual or future and planned Spaceborne Sensors (ENVISAT–ASAR, ALOS–PALSAR, RADARSAT2, TerraSAR X and SIRc).

The PolSARpro v2.0 software is provided with a wide–ranging tutorial and comprehensive documentation offering grounding in polarimetry and polarimetric interferometry necessary to stimulate research and development of scientific applications that exploit polarimetric data and techniques. Users have access to a comprehensive in–depth documentation permitting self–education to a high level (radar experts and post graduate students).

The PolSARpro v2.0 Software is developed to be accessible to a wide range of users, and is conceived as a flexible environment, proposing a friendly and intuitive graphical user interface (GUI). This graphical user interface (GUI), written in Tcl–Tk (207809 lines) manages today around 132 widget windows which control 494 C routines (215544 lines) performing well–established algorithms in the field of polarimetric radar signal processing. Due to its modular structure, each element of the software (a function) can be incorporated individually into users own processing software, and users can easily add new functions and components, as their need arises.
The PolSARpro v2.0 Software is running today on the following platforms: Windows 98+, Windows 2000, Windows NT 4.0, Windows XP, Linux I386 and Unix Solaris, and is made available following the Open Source Software Development (OSSD) approach. The PolSARpro v2.0 Software (source code and elements software packages) is made publicly available for free download on the Internet from the ESA Web Portal (Earthnet) at: http://earth.esa.int/polsarpro.

Today a new version of the software (PolSARpro v3.0) is continued to be developed under contract to ESA (Continued Development of PolSARpro Software, C.C.N to ESAESRIN Contract n° 17863/03/ILG) by a consortium comprising I.E.T.R at the University of Rennes 1, DLR–HR, AELc and Dr Mark L. Williams. A global overview of all the main functionalities proposed in the PolSARpro v2.0 Software and a development status of the new version will be presented during the Workshop, accompanied with demonstrations of the Tool.