earthbit

A desktop tool to ingest and process PRISMA data

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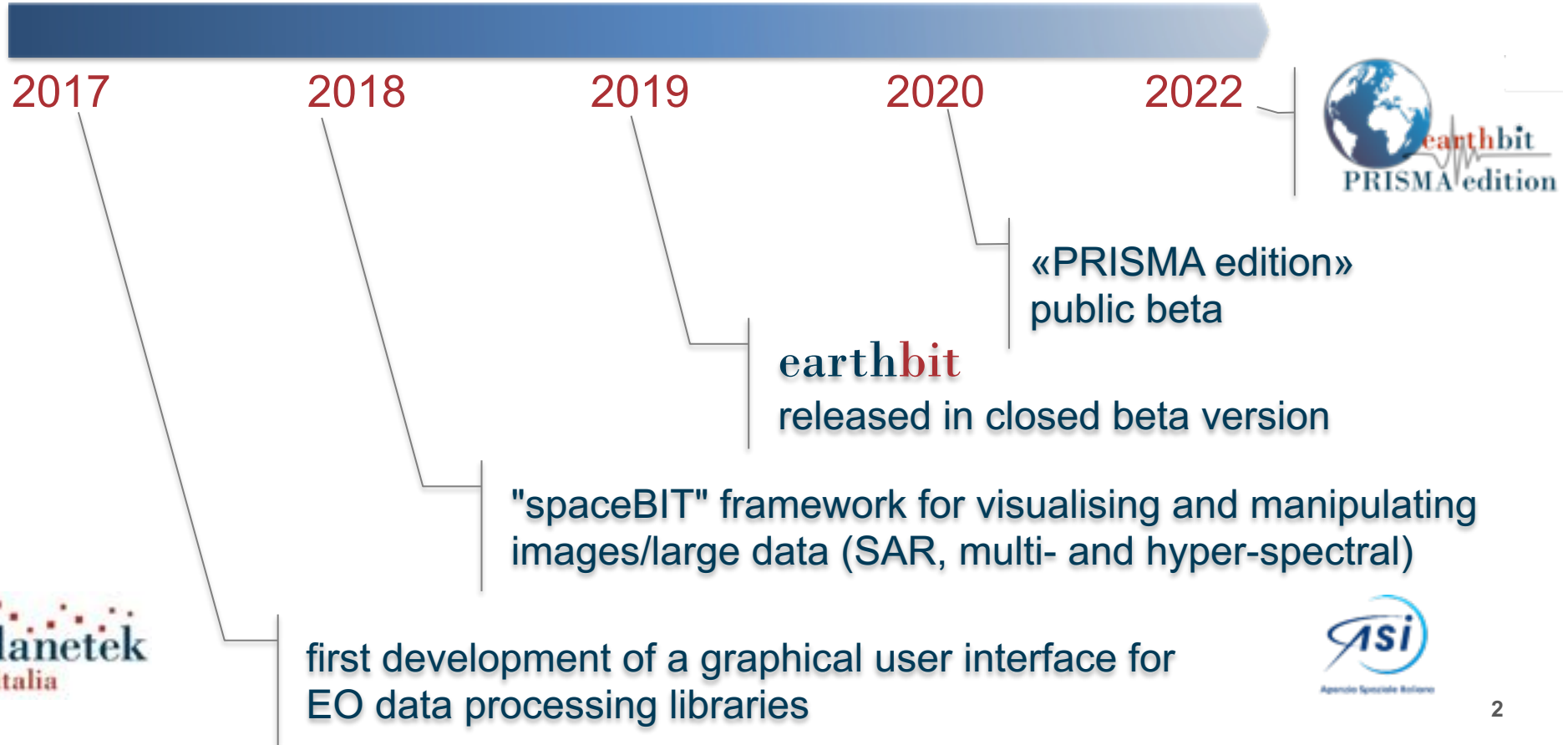
earthbit

2017   2018   2019   2020   2022

«PRISMA edition» public beta

earthbit released in closed beta version

"spaceBIT" framework for visualising and manipulating images/large data (SAR, multi- and hyper-spectral)

first development of a graphical user interface for EO data processing libraries
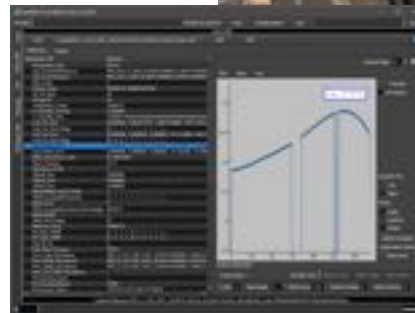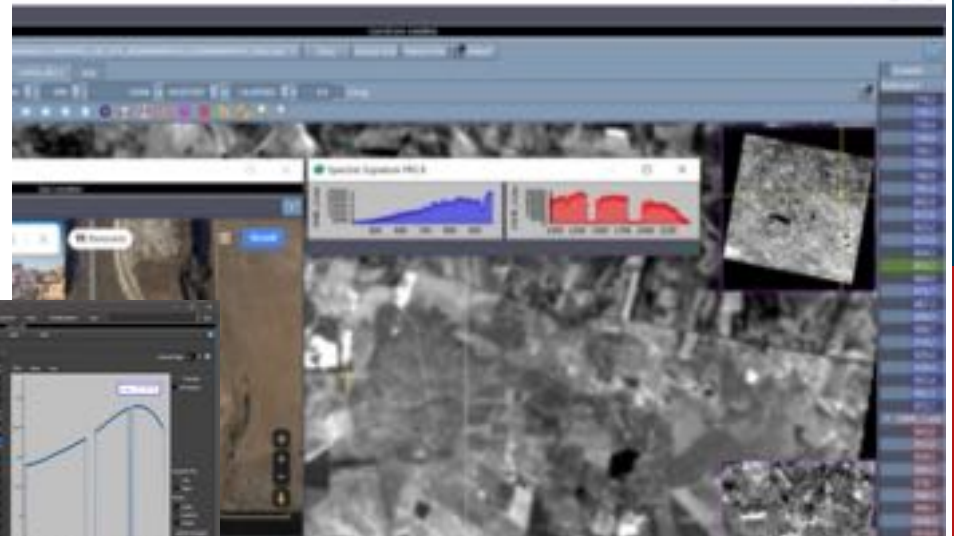
earthbit in a nutshell

- Manage SAR, optical multi- & hyper-spectral products
- Load datasets and attributes from hierarchical and generic data files (HDF5, HDF-EOS, NetCDF, TIFF, JPEG);
- Plug custom algorithms for image processing, exploiting the earthbit SDK features
- Execute processing and visualization algorithms on multi CPUs /GPUs, thanks to a proprietary acceleration engine (integrating Khronos OpenGL™ and OpenCL®)

- Visualization and navigation of «BIG» images
    - Load ~4GiB image from disk to memory in less than 15s
    - Create image pyramids on the fly, with in-memory caching of tiles
    - Maximize the usage of Solid State Disks
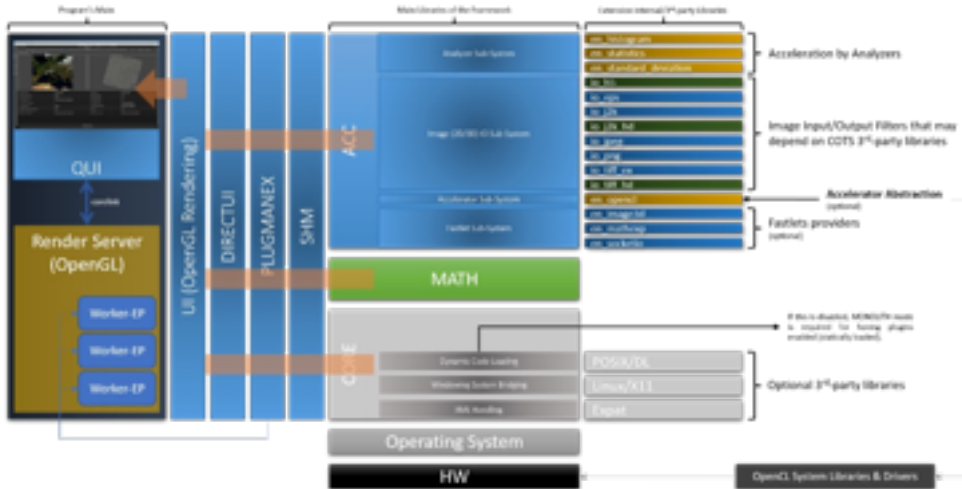   - real-time image filtering at ~400fps on GPU

Metadata management:
- Visualization, navigation, plot and export

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Framework and SDK

Multi-OS portability:

- Microsoft ® Windows10 (32bit & 64bit),
- Linux RedHat, Ubuntu Linux, CentOS 7, Gentoo Linux,
- Apple® macOS

Support for different architectures:

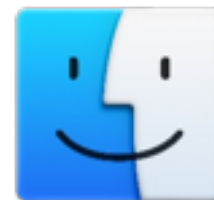- Intel/AMD x86 and x86_64,
- ARM ARMv7-A and ARMv8-A

The framework implements:

- operating system interfaces,
- image pixels reading and writing functions,
- hierarchical metadata reading and writing functions,
- exploitation of the available multicore CPU & GPU for intensive data processing acceleration,
- a Map/Reduce scheduler over multicore CPU,
- EO-specific image processing functions

Technology stack

- OS: cross-platform

- Core libraries: C++11

- HP Processing: OpenGL & OpenCL

- Plug-in: C++

- Scripting: python

A quick product viewer

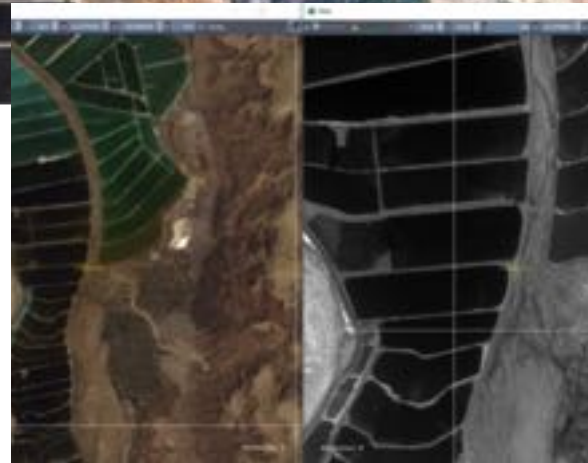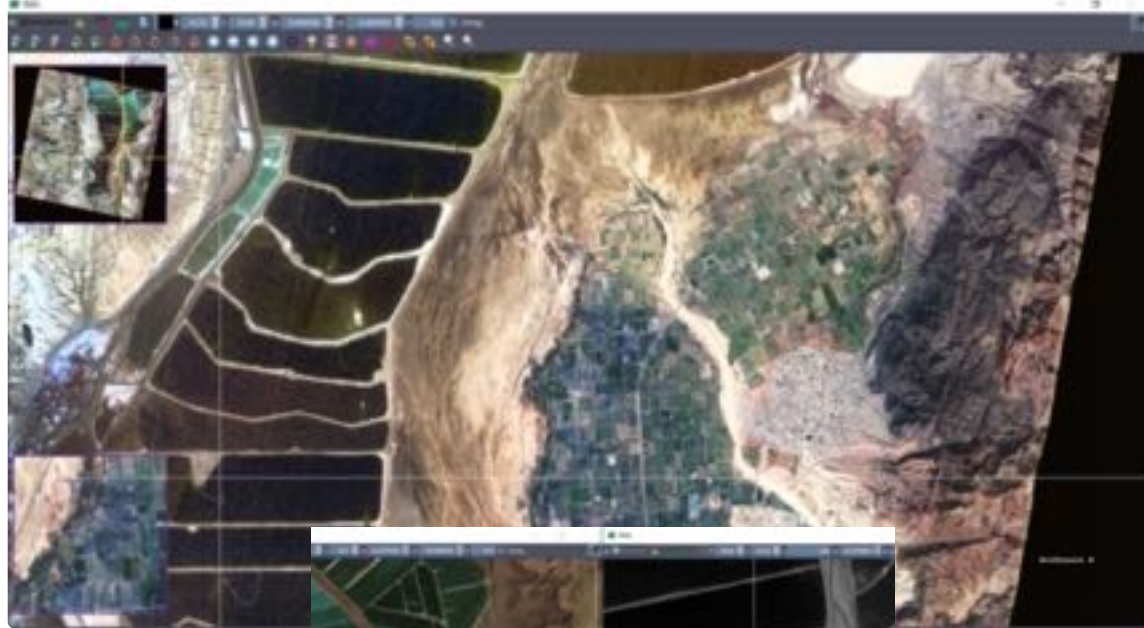*simplifying complexity*

Baseline features

- multiple detachable workspaces
  (data & metadata display)

  - side-by-side windows display & co-registered navigation of layers

  - multi-monitor support
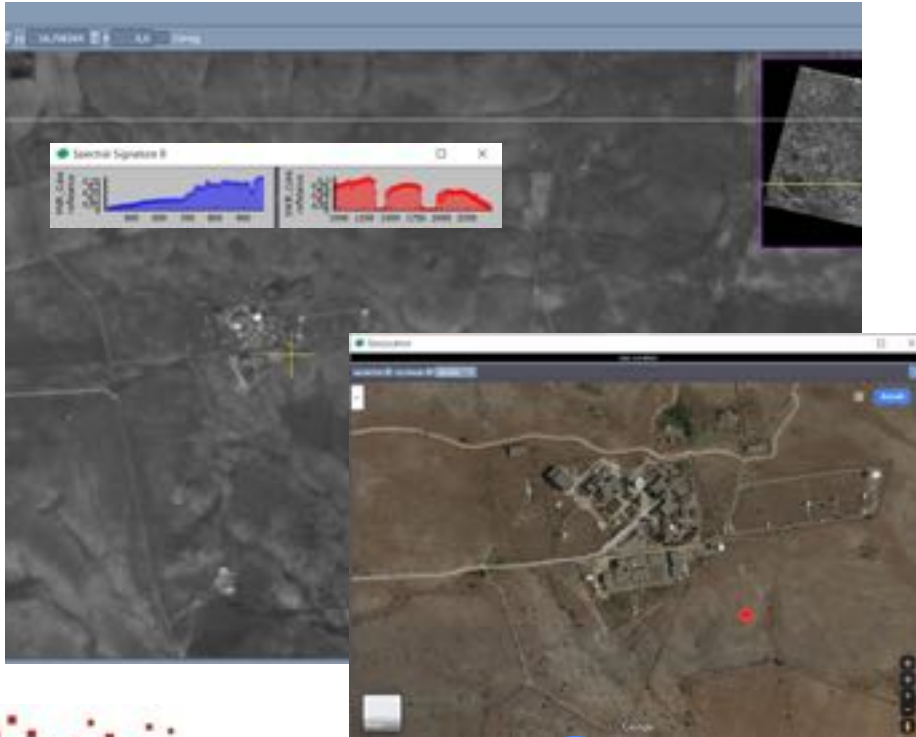
Designed to support final data users

- Multi-language interface (English, French, Italian)

  - Help-online

    - PRISMA products description

Features

Basic functions
- Import and display of PAN and HYP cubes (real-time pan and zoom)
- Display, search and plot of metadata

Advanced
- Product Preview
- RGB and Quick-look on the fly
- Image stretching with histogram (PAN, RGB, single band)
- North orientation of PRISMA non-geo-coded products (L1, L2B, L2C)
- Pixel-based spectral signatures (cube coring)
- Export of spectral signatures to CSV
- Navigation on WGS-84 map
- Pixel based Google Maps queries
- Band by band preview and display
- Bands jpeg & geoTIFF export

planetek
italia

Google
maps

Features

- Image histogram
  - Real-time stretching sliders
    - Real-time filters
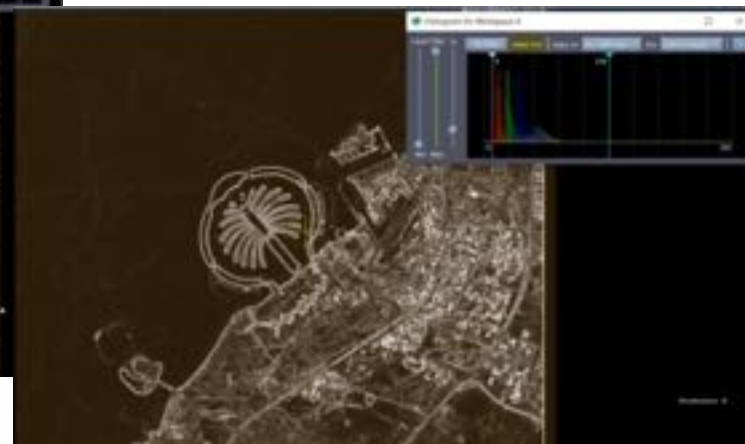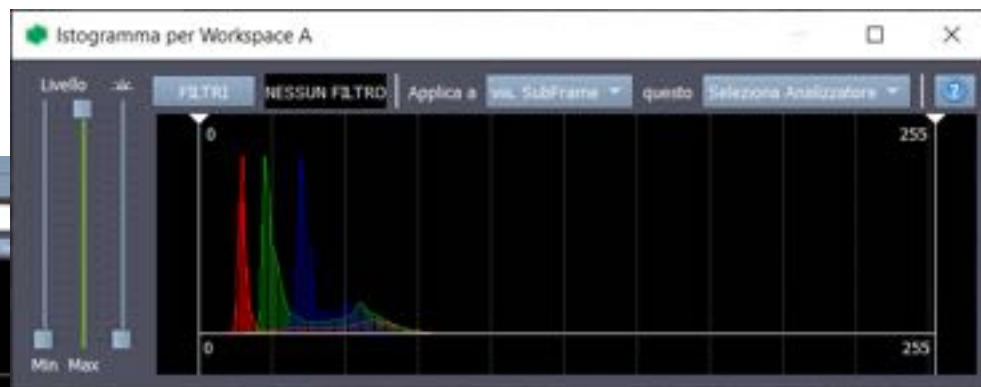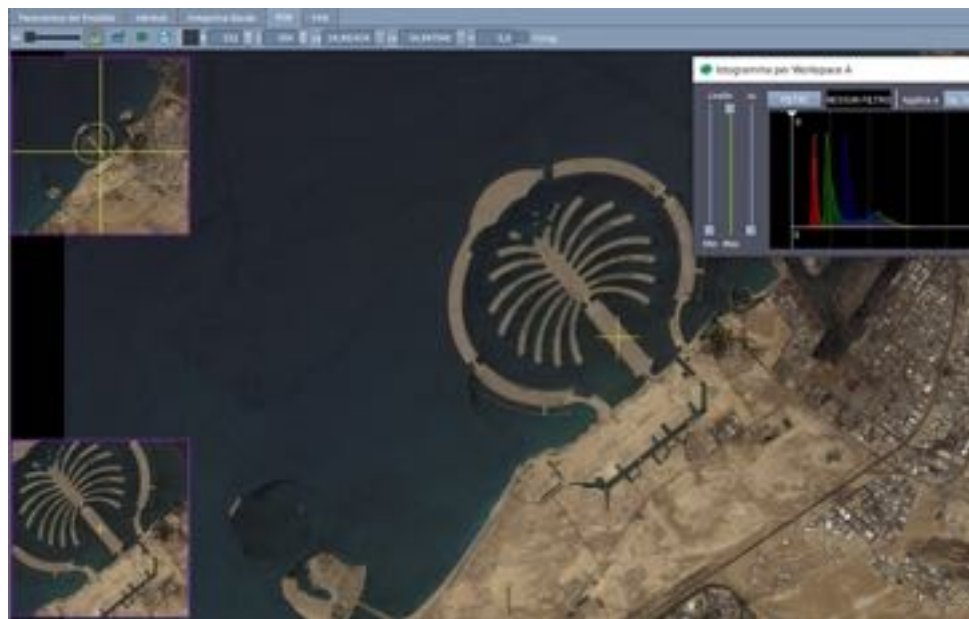
Roadmap

- Python scripting editor
- Python PRISMA API
- Band Arithmetic
- Blueprint for building processing workflows

- Additional metadata:
  - Roll-angle, Azimuth-angle calculation
- Additional map overlays/transparency and PRISMA error masks

- Demonstration algorithms for PRISMA
  - Pansharpening
  - Super-resolution
  - PCA
- Image compression (for product portability ~1GB->300MB)

Python

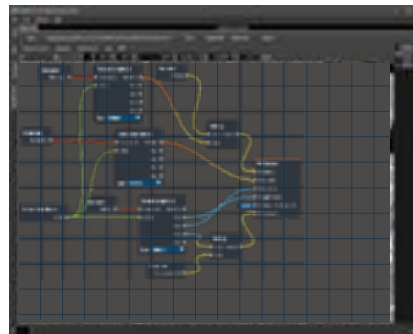Python bridge & API allowing data & metadata management for

- spectral analysis,
- metadata processing,
- bands arithmetic,
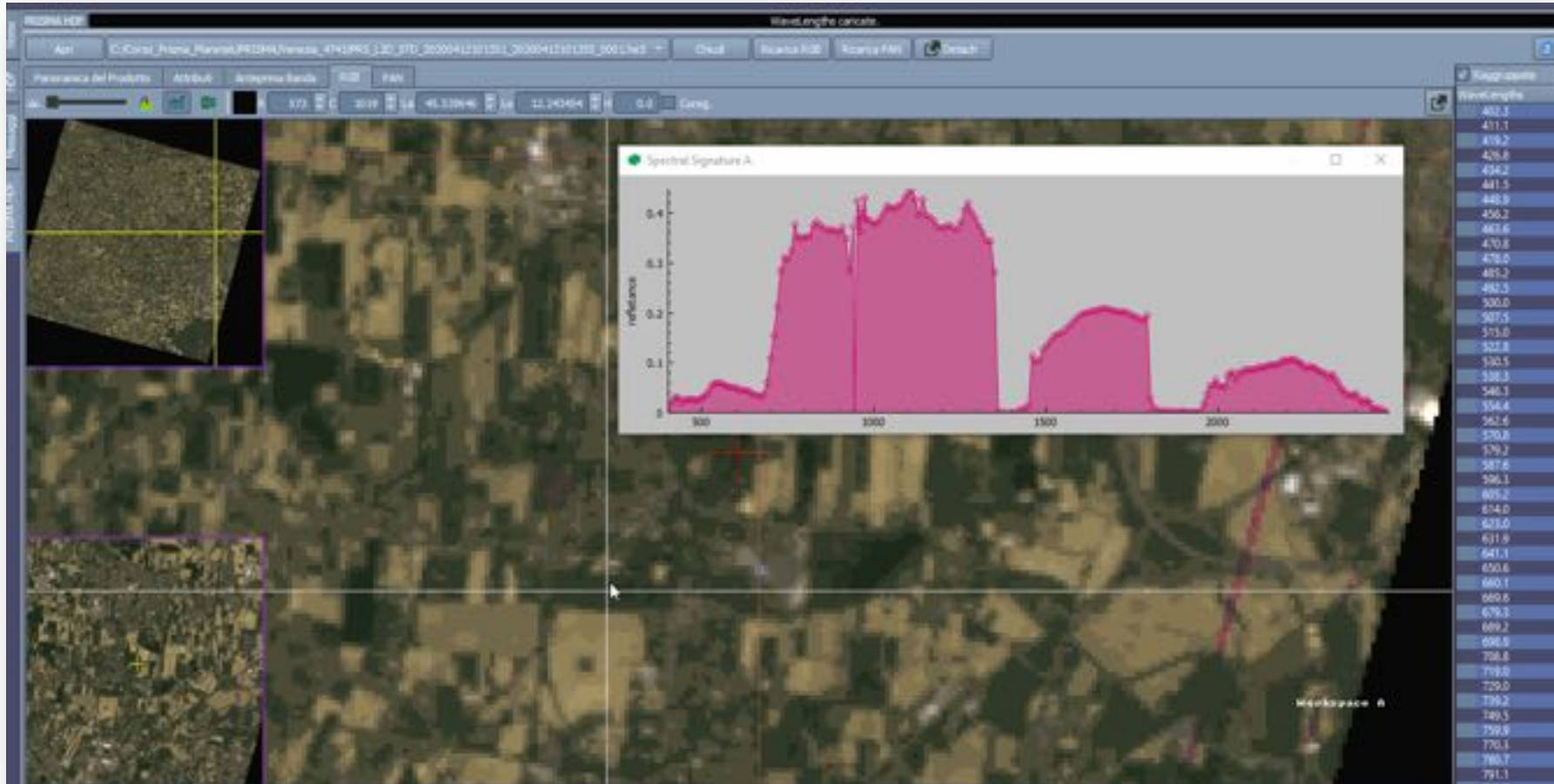- classification
- ...

Blueprint editor

The schematics editor configures & composes

- Python routine blocks,

- Compiled SW blocks (C++, OpenCL …)

earthbit in action

Let's keep in touch

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