PRESS RELEASE

PHOTOMOD SARExt — a new module for radar images processing

JSC RACURS presents **PHOTOMOD SARExt**, a new module of the PHOTOMOD digital photogrammetric workstation (DPW) designed for radar images processing using rational polynomial coefficients (RPCs). The module integrates into the complete mapping production cycle and is responsible for radar data processing, from radiometric correction and block adjustment to the construction of digital surface models (DSMs) and orthoimages.

Radar imaging is independent of cloud cover and illumination, which makes it indispensable for monitoring hard-to-reach areas and territories with unstable weather conditions. Including this type of data into the PHOTOMOD processing chain allows specialists from various fields to solve spatial analysis tasks within a single software environment.

Functional Capabilities

In combination with the existing DPW functionality, the **PHOTOMOD SARExt** module provides:

- radiometric correction of radar images;
- block adjustment of radar images using RPCs with tie and ground control points;
- interferometric processing of image pairs with interactive selection of interferometric pairs according to specified parameters;
- radargrammetric processing and vectorization in stereo mode;
- construction of DSMs using interferometric and radargrammetric methods;
- construction of orthoimages from blocks of amplitude images.

Key Features

Block processing. Unlike pairwise processing, the module operates with a block of radar images: a full-featured uncontrolled mosaic and a view of the block spatial layout are available.

Multi-sensor processing. Data from different radar sensors can be processed together within a single PHOTOMOD project.

Data formats. The SLC and RDP (the internal format of the PHOTOMOD Radar software) formats are supported.

Integration with PHOTOMOD functionality. Available functions include primary processing, construction, editing and logical operations with DTMs and DSMs, batch

orthotrasformation, mosaic construction with brightness equalization, manual correction of results, and distributed processing in local and network configurations. The PHOTOMOD Core, StereoDraw and Mosaic modules provide advanced vectorization capabilities.

Supported sensors. Kondor-FKA, Obzor-R, TerraSAR-X, Sentinel-1 (StripMap mode only), Gaofen-3, Spacety TY-SAR, RADARSAT-2.

Intended Users

PHOTOMOD SARExt is designed for organizations that require reliable information on the location and condition of Earth surface objects, in addition to optical data or where optical data availability is limited:

- **mapping and topographic-geodetic organizations** — creation and updating of topographic maps and plans, DSMs and orthomosaics;
- **cadastral services and land management** — updating information on land parcels and real estate objects;
- **forestry and forest management** — inventory and monitoring of forest areas, including those in hard-to-reach regions;
- **emergency response and emergency monitoring services** — situation assessment in areas of floods, fires, landslides and other incidents, regardless of cloud cover and time of day;
- **mine surveying and geological services** — monitoring the state of terrain and surface in mining and industrial areas;
- **water management, ecology and agriculture** — study of terrain, hydrography and land condition;
- **urban planning, transport and energy** — surveys and design of linear and areal infrastructure facilities;
- **scientific and educational organizations** — research and training of specialists in remote sensing field.

PHOTOMOD SARExt and PHOTOMOD Radar: Choosing a Solution

The **PHOTOMOD SARExt** module is designed for processing blocks of radar images, construction of DSMs and orthomosaics, and vectorization.

The full-featured high-precision **PHOTOMOD Radar** system is designed for tasks requiring maximum accuracy and in-depth analysis of the radar signal (monitoring of displacements and changes of the Earth's surface by differential interferometry, coherence analysis, detection and geospatial localization of ships, oil slicks and other objects using correlation and neural network algorithms).

The main differences are presented in the table.

Characteristic	PHOTOMOD Radar	PHOTOMOD SARExt
Application areas	The tasks of in-depth analysis of the radar signal with high precision	Processing of radar images blocks, construction of DSMs and orthomosaics, vectorization
Supported sensors	Kondor-FKA, Obzor-R, TerraSAR-X, Sentinel-1, Gaofen-3, Spacety TY-SAR, RADARSAT-2, Kondor-E, Radarsat, COSMO-SkyMed, ICEYE, Capella, KOMPSAT-5, ALOS-2, PALSAR, Envisat, ERS, SIR	Kondor-FKA, Obzor-R, TerraSAR-X, Sentinel-1 (StripMap mode only), Gaofen-3, Spacety TY-SAR, RADARSAT-2
Structure of processed data	Image pair / image stacks	Image block, uncontrolled mosaic
Image adjustment	Rigorous imaging model; each image adjusted separately using ground control points	RPC model; block adjustment using tie and ground control points
Image analysis (classification and thematic mapping, coherence analysis)	+	-
Marine applications (oil slicks detection; ship detection; sea wave analysis)	+	-
Neural-network processing	+	-
Multi-sensor processing within a single project	-	+
Distributed processing	-	+

The full description of the modules and the technological scheme are available at en.RACURS.ru/program-products/tsfs-photomod/.

Additional information is available on the website **https://en.RACURS.ru** or via e-mail at **COM@RACURS.ru**.

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