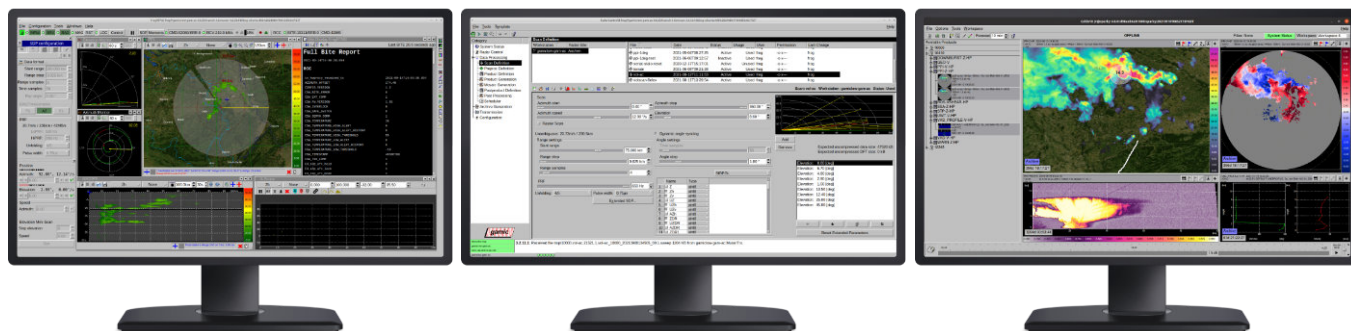GAMIC weather radar software
Frog-Muran

Comprehensive weather radar software suite for single radars and multi-radar networks

Frog-Muran is the complete weather radar software suite by GAMIC, suitable for single radars and radar networks. It comprises various tools for any weather radar related task – control, calibration and maintenance, product generation and scheduling, visualization, and much more.

COMPATIBLE WITH ANY WEATHER RADAR SYSTEM

Designed to be fully independent of equipment, Frog-Muran is compatible with all types of weather radars (**X/C/S-band; magnetron, klystron, or solid-sate transmitters**), with single or dual polarization, and including pulse compression options. No matter whether you are running a **stand-alone radar or a multi-radar network**, Frog-Muran is the perfect software for you.

INTERNATIONAL REFERENCES

The software suite has been successfully implemented worldwide over 250 times. It is in operational usage by **national weather services, airports, research institutions, armed forces, and other facilities**. Frog-Muran has been approved for operation in national weather service networks with multiple radars, e.g. Germany (18 radars), Morocco (6 radars), Brazil (18 radars), India (10 radars), and Indonesia (5 radars).

VARIOUS OUTPUT PRODUCTS

The following is an overview of meteorological, hydrological, and more output products that are available with Frog-Muran. See inside of this leaflet for more details.

» **Standard products** (PPI, RHI, CAPPI, …)
» **Echo analysis** (echo base, echo top, …)
» **Hydrological products** (rain rate, accumulated precipitation, …)
» **Wind analysis products** (wind profile, vector field, …)
» **Wind and shear detection** (azimuthal shear, elevation shear, …)
» **Storm analysis** (vertically integrated liquid, storm structure, …)
» **Warning of severe weather** (hail, flooding, microburst, gust front, …)
» **Tracking and forecasting** (interactive, automatic, …)
» **Composition and data integration** (Lidar, AWOS, rain gauges, lightning, …)

Features

» **Radar observation and maintenance**
» **Multi-radar networking** tools
» Configuration of **scan strategies**
» **Scheduling and automation** of tasks
» Many meteorological and hydrological **product generation algorithms** for various applications
» **Pre- and postprocessing routines** for data enhancement and distribution
» Powerful **product visualization, animation, and export** tools
» **Easily extendable** with flexible licensing concept
» **Configurable user** administration

Data formats

» **GAMIC HDF5**
» **ODIM HDF5**
» **Export** to NetCDF, OPERA ODIM HDF5, CFRadial, BUFR, and many more…

gamic
WEATHER RADAR & SIGNAL PROCESSING

www.gamic.com
info@gamic.com
+49 241 889110

DIGITAL VERSION

CORE APPLICATIONS

Frog
Real-time surveillance and maintenance
» Real-time radar parameter surveillance
» Hardware and software status information and visualization
» Manual control of transceiver, pedestal, and other hardware
» Assisting tools for radar installation, calibration, and maintenance tasks

RadarControl
Scheduling and controlling tasks
» Comprehensive logging system
» Scheduling of tasks like product generation and pre-/postprocessing routines
» Creation of multi-radar composites (opt.)
» Distribution of generated data to workstations and server infrastructure
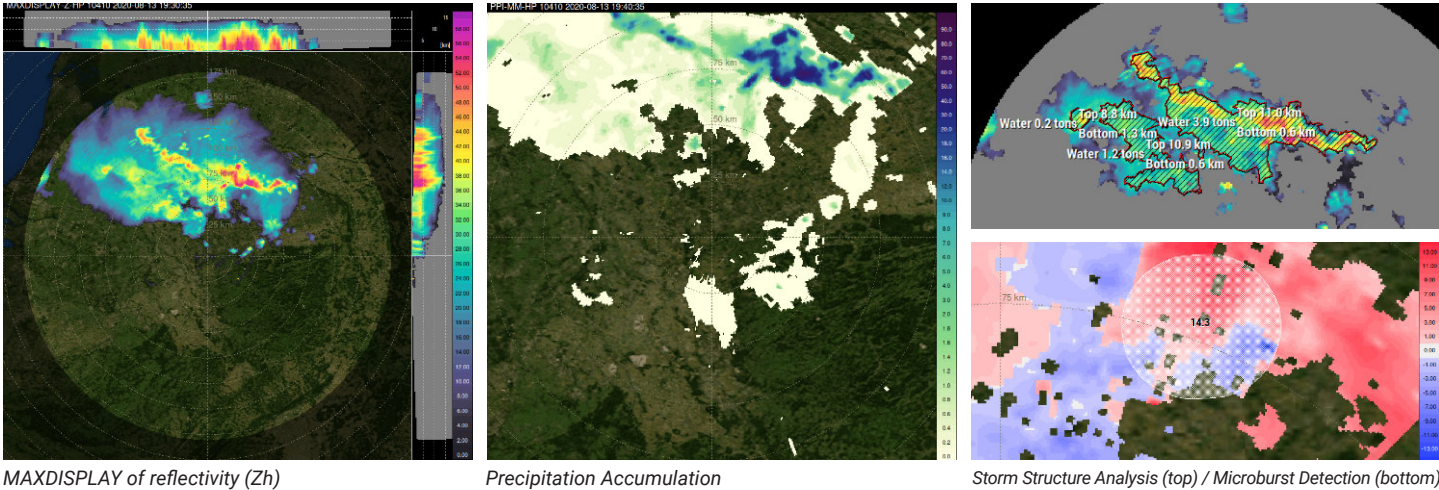» Configuration of user profiles with individual permissions

Colibri
Visualization and animation of products
» Visualization and animation of meteorological and hydrological products
» Configurable color legends
» Export of single product images and product animations
» Multi-window workspaces for synchronous display of products
» Arbitrary vertical cross-sections

ADDITIONAL TOOLS

» **Mosaic** Compositing of multi-radar network products
» **3DView** Interactive 3D radar data visualization
» **Webview** Browser-based product visualization
» **IIDG** Internet image data generation
» **Internet Server** for data access via web-browser and PC
» **GSF** Radar-based storm tracking and nowcasting

» **Warn** Weather decision aid system
» **Asterix** ATC console weather data generator (CAT008/009)
» **Data Integration** Lidar, AWOS, rain gauges, lightning, …
» **StormScanner** Tracking and automatic scanning of cells
» **Dashboard** System health monitoring and data analysis
» **RGOptimizer** Z-R relationship estimation from rain gauges

New!

EXAMPLE SCREENSHOTS

MAXDISPLAY of reflectivity (Zh)

Precipitation Accumulation

Storm Structure Analysis (top) / Microburst Detection (bottom)

RADAR MOMENTS AND PRODUCTS

Input moments

Standard moments	
Z	Reflectivity
V	Doppler Velocity
W	Doppler Velocity Spectrum
R	Rain Rate

Dual polarization moments	
HMC	Hydrometeor Classification
ZDR	Differential Reflectivity
LDR	Linear Depolarization Ratio
PhiDP	Differential Phase Shift
KDP	Specific Differential Phase
RhoHV	Correlation Coefficient

Standard products

Included in every Frog-Muran installation	
PPI	Plan Position Indicator
RHI	Range Height Indicator
CAPPI	Constant Altitude PPI
VXSECT	Vertical Cross Section
MAXDISPLAY	Horizontal and Vertical Maximum Values

Optional products

Preprocessing and correction	
BBLC	Beam Blockage Correction
BBC	Bright Band Detection and Correction
PREC	Precipitation Attenuation Correction
VPR	Vertical Profile of Rain Correction
OCC	Beam Occultation Correction

Echo analysis	
ETOP	Echo Top
EBASE	Echo Base
ETH	Echo Thickness
LMAX	Layer Maximum Value
HMAX	Maximum Height of Maximum Values
LMR	Layer Mean Reflectivity

Precipitation and hydrology	
SRI	Surface Rainfall Intensity
SHR	Surface Hourly Rainfall
VIL	Vertically Integrated Liquid
PAC	Precipitation Accumulation
PAL	Long Time Precipitation Accumulation
RIH	Rainfall Intensity History
PRT	Point Rainfall Total Plot and Table
RSA	River Subcatchment Accumulation
RGAUGE	Rain Gauge
VPR	Vertical Profile Correction

Wind analysis	
VAD	Velocity Azimuth Display
VVP	Volume Velocity Processing
UWT	Uniform Wind Technique
HWIND	Horizontal Wind, Radial Velocity at Constant Altitude

Wind shear and turbulence	
RDS	Radial Shear
AZS	Azimuth Shear
ELS	Elevation Shear
RAS	Combined Radial/Azimuth Shear (2D Azimuth Shear)
RES	Combined Radial/Elevation Shear (2D Elevation Shear)
3DS	Combined Radial/Azimuth/Elevation Shear (3D Shear)
HZS / LLSHEAR	Horizontal Shear / Low Level Wind Shear
VCS	Vertical Shear
SHEAR	All-Shear Package
LTB	Layer Turbulence, Shear between two Layers
FF	F-Factor Estimation based Warning

Storm analysis	
SRV	Storm Relative Velocity
SMV	Spectrum Mean Velocity
SSANA, SSA	Storm Structure Analysis

Severe weather and phenomena detection and warnings	
VIR	Vertically Integrated Reflectivity
WARN	Automatic Severe Weather Warning
SWI	Severe Weather Indicator
SWAD	Severe Weather Analysis
FCOM-WARN	Severe Weather Feature Combination
MESO	Mesocyclone Detection
GUST	Gust Front Detection
MBD	Microburst/Macroburst Detection
DSD, PSD	Dust/Particle/Sand Storm Detection
HAIL	Hail Detection
IDW	Ice Detection and Warning
VERG, CDVERG	Convergence and Divergence

Tracking and nowcasting	
ITRACK	Interactive Storm Tracking
STP, GSF	Automatic Storm Tracking
RSTP	Rain Tracking
CSTP	Centroid Tracking

Utilities and data integration	
CMM	Combined Moment Map
Export	Local, FTP, SCP, SFTP
Data Conversion	ODIM, NEXRAD, NetCDF, ASCII, XML, …
AWOS	Automated Airport Weather Station Integration
DRL	Dynamic Raster Underlay (e.g. satellite data)
DVL	Dynamic Vector Overlay (e.g. flight data)
LIGHT	Lighting Data Overlay
LLWAS	Low-Level Wind Shear Alert System Integration
NWP	NWP Interface