swiss-birdradar.com

Swiss Birdradar Solution AG

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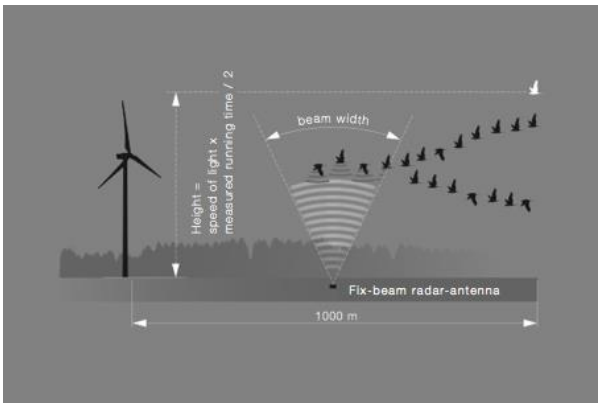
Avian Monitoring and Collision Risk Management Radar

System description Birdscan MV:

The monitoring system is designed for long term monitoring and adaptive management of wind parks to mitigate migratory bird collisions risk while at the same time optimizing the production loss. The collision risk is calculated using radar plus environmental data available at the site of the wind park. If the collision risk exceeds the specified threshold, the system alarms the plant operator or can automatically communicate with the wind park controls.



General description: The BirdScan MV system uses a vertically rotating conically shaped wide aperture beam to collect a rich set of information of the avian biomass. It uses scientifically proven real time quantification and classification algorithms as the most important parameter but also considers environmental conditions like humidity, visibility, wind speed, direction and current power production to reach the optimum balance between bird protection with a minimum of outage time, within the framework conditions given by the regulator. System supervision and control is done through a web server, connection to the wind park controls is done via SCADA interface.

Comparison to traditional bird-radars: Traditional horizontally or vertically rotating bird-radars only illuminate a target for a fraction of second and wing-flapping pattern cannot be recorded. Therefore non-bird echo's like insects cannot be properly excluded. In traditional rotating radars the surveyed volume is generally not well-defined and therefore computation of MTR as well as subsequent risk assessment is arbitrary.

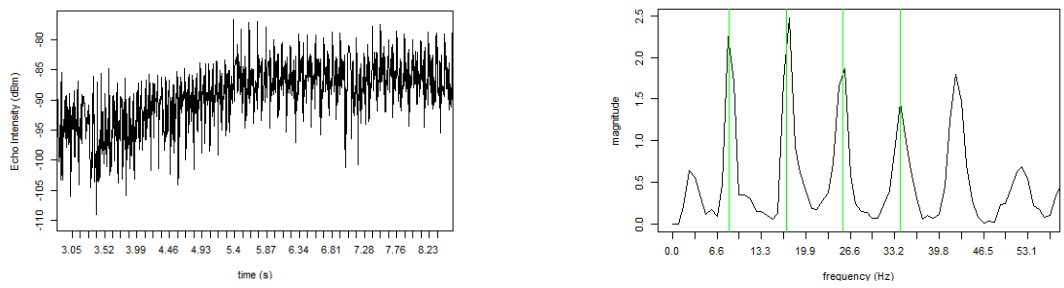
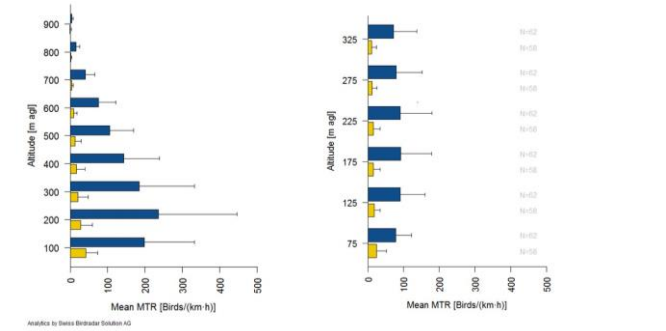


Figure 1. Example of echo from a bird recorded by the system (left). The wing-flapping pattern is recorded with the signal and can be extracted automatically with our analytics modules (right), here a continuously flapping bird with 8 wing-beats per second.

High quality analytics: Beside of the real time information available online, also site specific operations reports are available directly from the user interface.

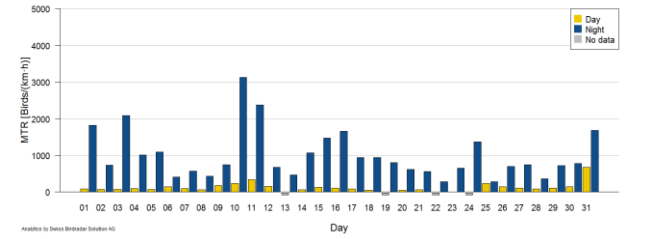
Raw data with hundreds of thousands echo's and environmental conditions per month can be recorded on a local NAS or can be downloaded via direct link into a data centre for offline analyses if required. To leverage the full potential of this data, detailed off-line analytic can be performed by the client or third party scientists.

Example reports:



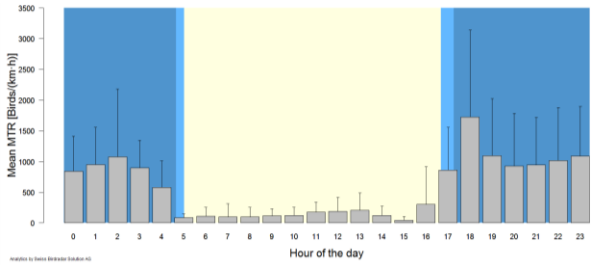
The AVLR MV System delivers the signature of all objects passing the radar beam, allowing quantification and classification for e.g mean traffic rate (MTR) per hight segment

(graph shows MTR calculation for selectable altitude level for wader type bird)

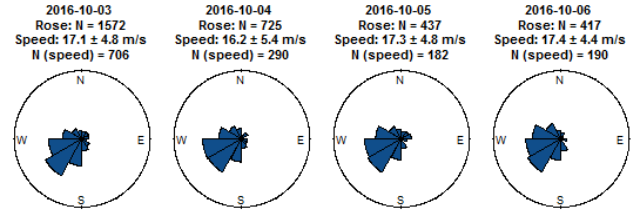


Based on exact times for dusk and down the MTR is calculated for day and night.

(graph shows MTR average values for hight level 50 - 1000 m)



(graph shows 5 minute MTR values shown with min-max. values per hour)



(graph shows detailed flight details and directions over four nights)

Placement with respect to wind turbines: Like for any radar, rotating blades within the measurement beam would produce strong disturbances. For good measurement results, the radar should therefore be placed with a minimum distance of approx. 150 m to the wind turbines.

Product Specification: BirdScan MV

Area of application	**-long term monitoring -active collision management**
sensing technology	pulse radar
antenna system	corrugated vertical horn (rotating)
transmitter frequency	x-band fixed
transmitting power	25 kW peak
range (height)	2000 m
resolution in space	10m
shutdown algorithm based on:	-spatiotemporal distribution -classification -mean traffic rate -environmental conditions
raw data	available for offline analyses
operation	automatic 24 h
electrical connection	1x230V 400W
communication	LAN / WAN / LTE / SCADA
weight	approx. 100 kg
environmental design	MIL STD 810 F
climate kit (optional)	HVAC, 1x230V 700W, 30kg
offshore kit	available

Winterthur, 23.05.2019