

Novinky v oblasti lavinové prevence a praktický výstup z International Snow Science Workshop 2018 v Innsbrucku

Jan Pala

Komise tradičního skialpinismu ČHS

3. LF UK Praha

29. Pelikánův seminář

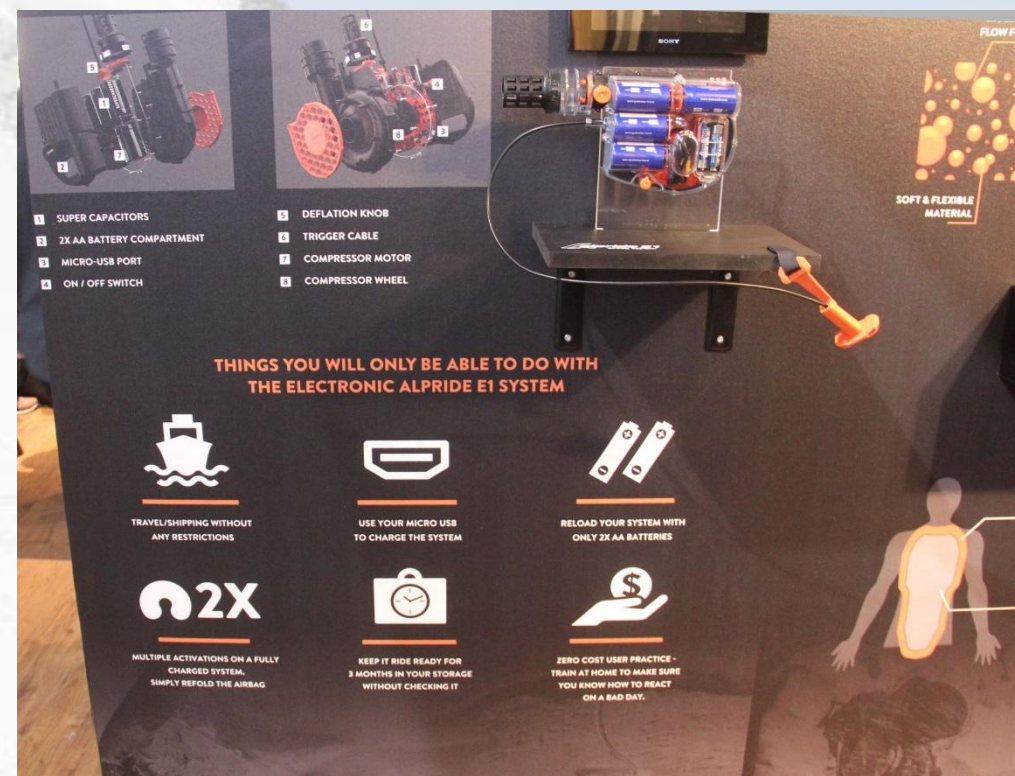
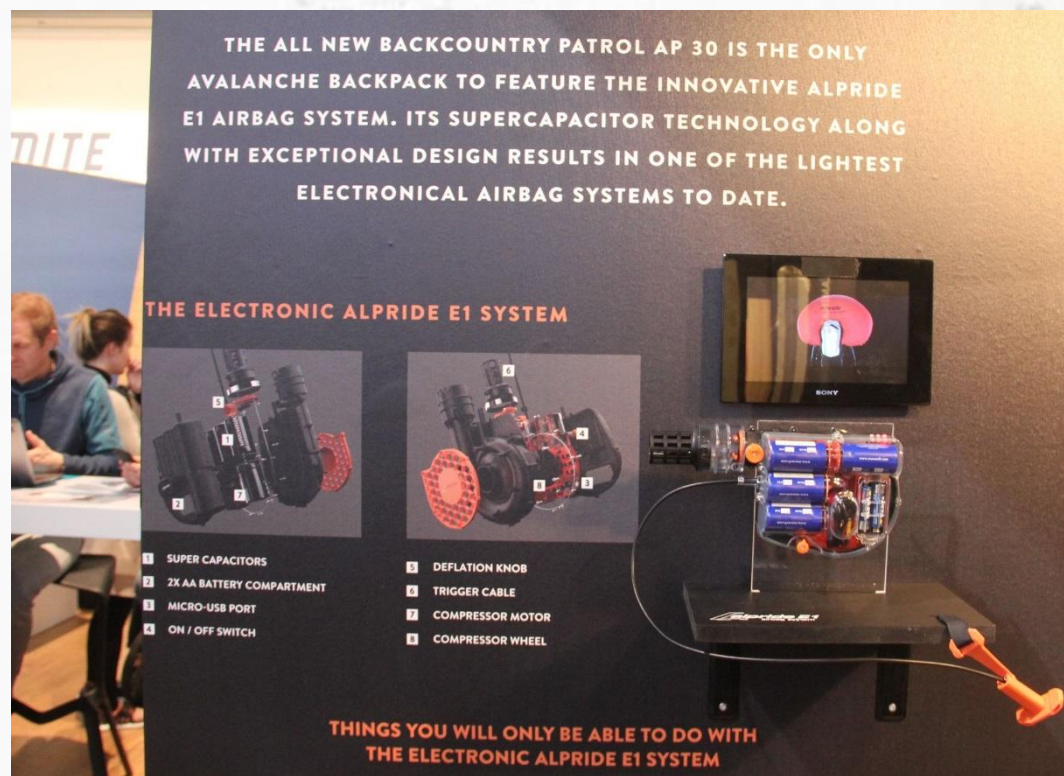
27. 10. 2018 Chata Pláně pod Ještědem

Co je nového?

- Nové lavinové batohy s různými technologiemi
- Rozšíření RECCO
- Nové možnosti nouzového spojení se záchrannou službou
- Nové možnosti tréninku lavinové záchrany

Alpride E1 – nový lavinový batoh

- Horkou novinkou **Alpride E1** – batoh založený na dvou kondenzátorech s dobitím pomocí dvou AA baterek



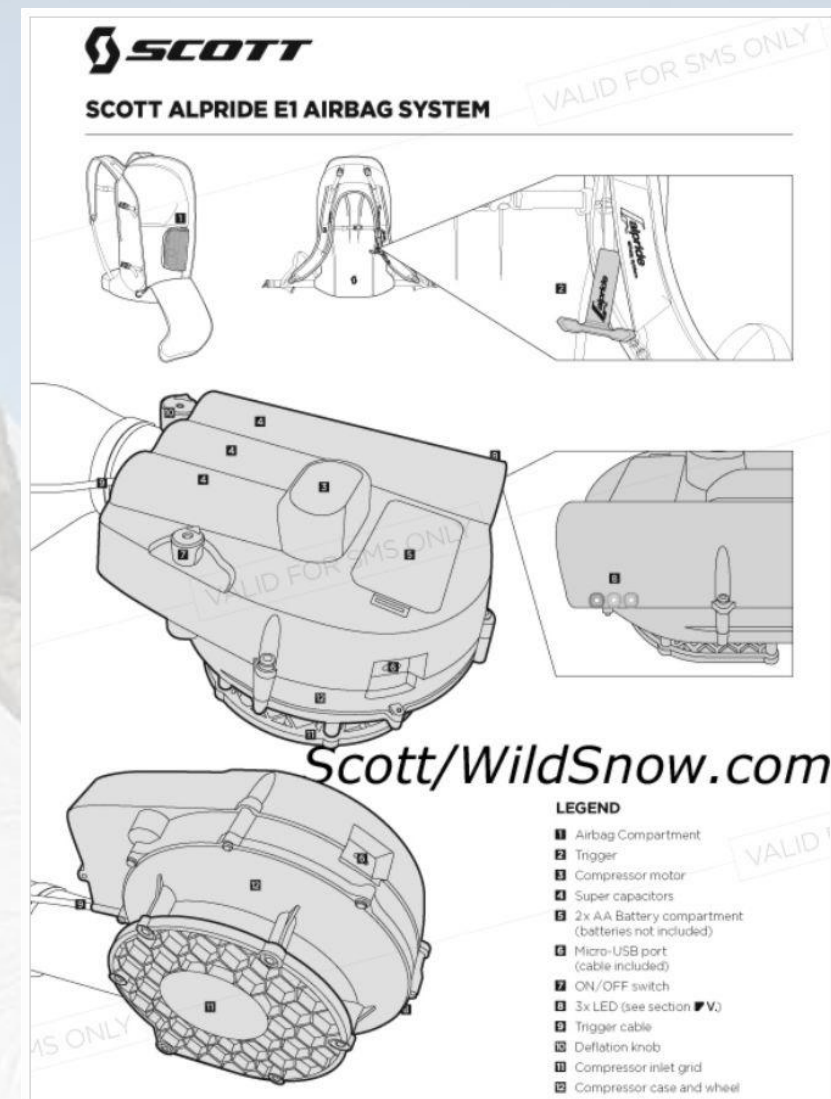
Alpride E1 – nový lavinový batoh

- Objem vaku 150 litrů, systém samotný 2,4 litru
- Hmotnost systému 1280 g, hmotnost 30 l batohu 1390 g



Alpride E1 – nový lavinový batoh

- Rozsah použití -30 až +50 C
- Znovunabití kondenzátorů až 500 000 x
- Nabíjení 20 min přes USB a 40 min pomocí dvou AA baterií
- Kondenzátory vydrží nabité 2-3 měsíce se dvěma AA bateriemi
- V testech zatím přes 10 000 odpalů bez batohu
- Není problém s leteckou či jinou přepravou



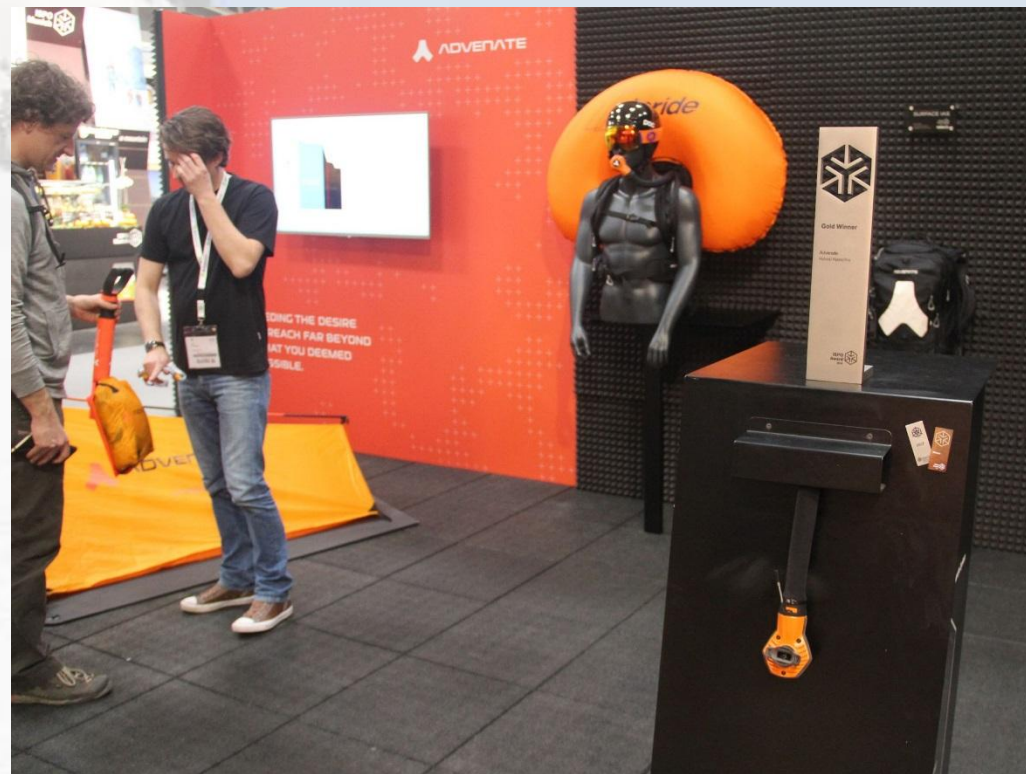
Advenate IAS – lavinový batoh + „Avalung“

- Integrated Avalanche System
- Současná aktivace obou částí systému



Advenate IAS – lavinový batoh + „Avalung“

- Kombinace lavinového batohu s možností dýchání v případě úpného zasypání



Aerosize – lavinový batoh

- Dvojitá hranatá konstrukce lavinové vesty nebo batohu, plynem se aktivuje vnější plášť, vnitřní vak se plní okolním vzduchem



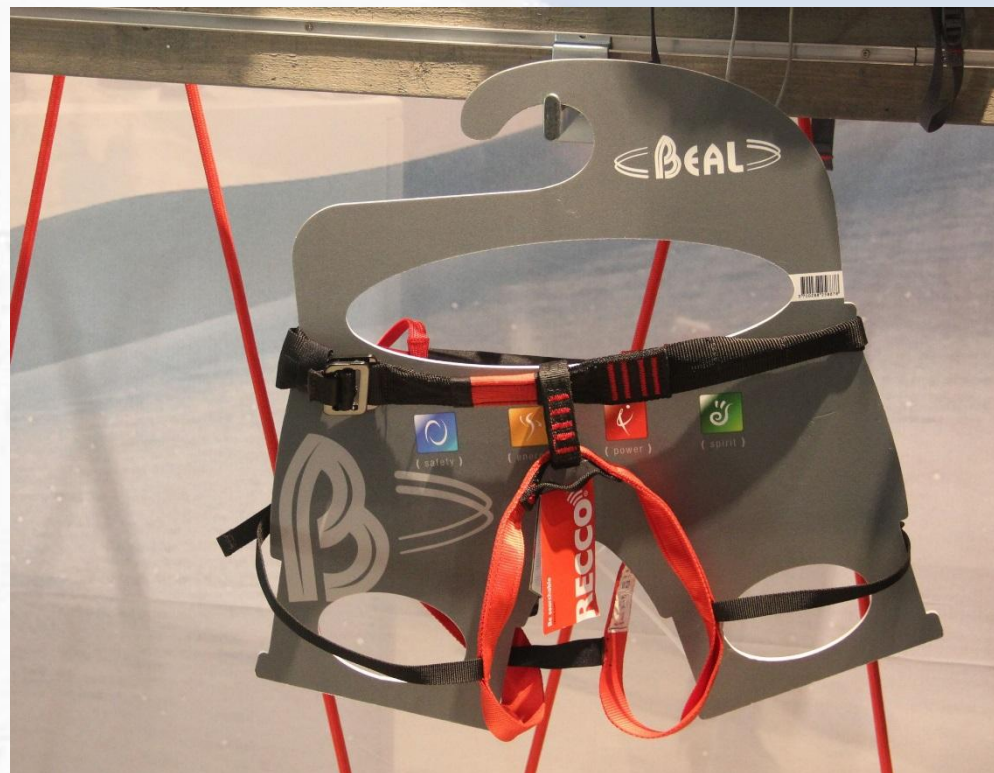
Aerosize – lavinový batoh

- 150 litrů, k aktivaci méně než 55 g Argonu, hmotnost přibližně 1600 gramů



RECCO jede...

- Aktuálně přes 800 středisek na světě



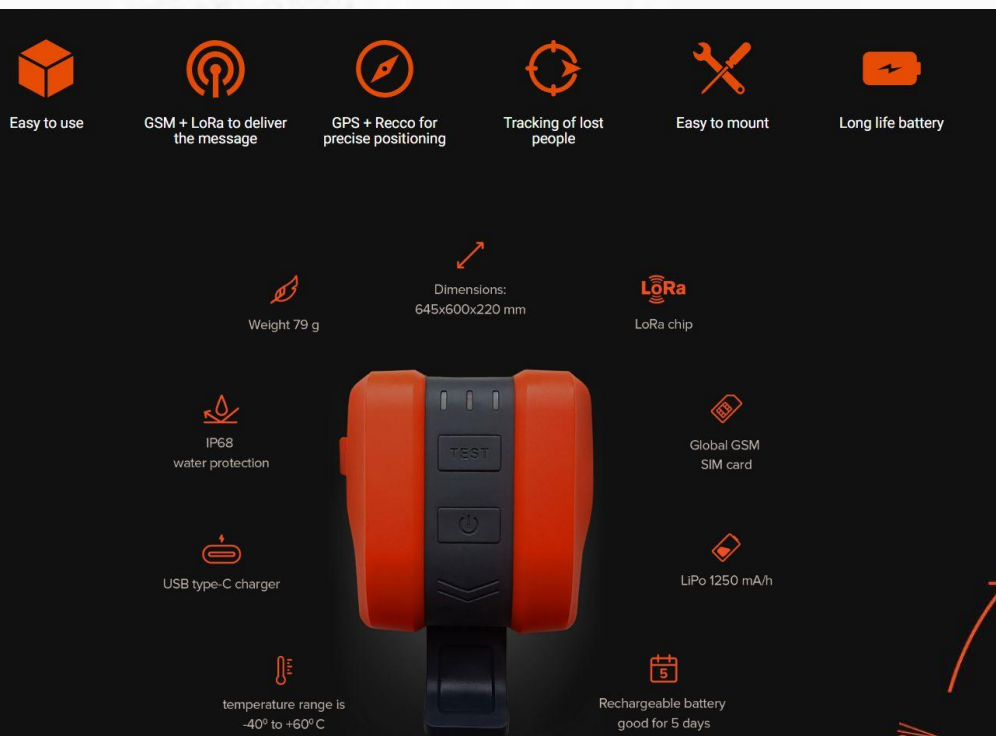
Argentina 4
Chile 2
Ekvádor 1
Kazachstán 1
Lichtenštejsko 1
Polsko 4
Rumunsko 1
Rusko 5
Srbsko 2
Slovinsko 1

Pomůcky Resero Whistle a ProtoGear A*LIVE

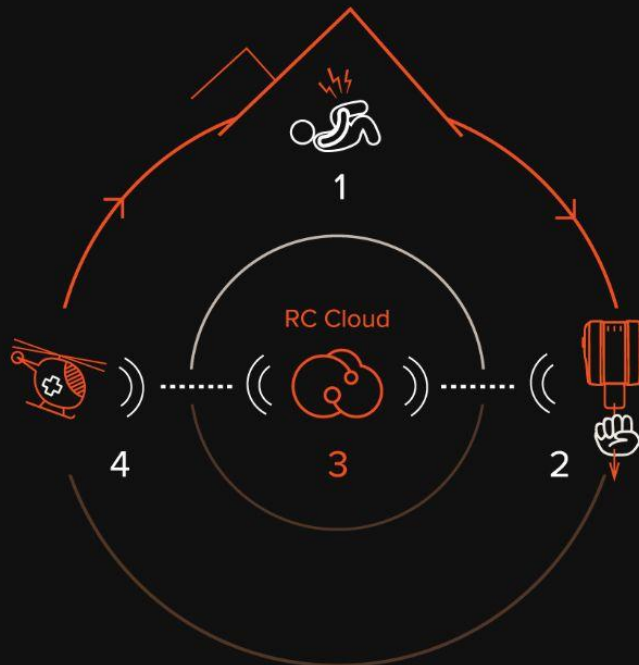
- Jak se spojit se záchranou? Pokud je dostupná...



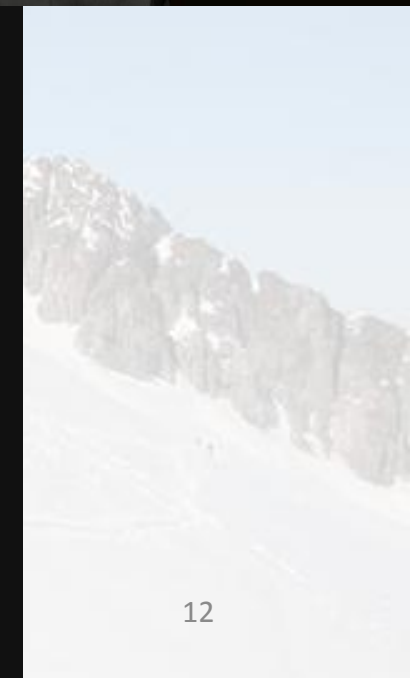
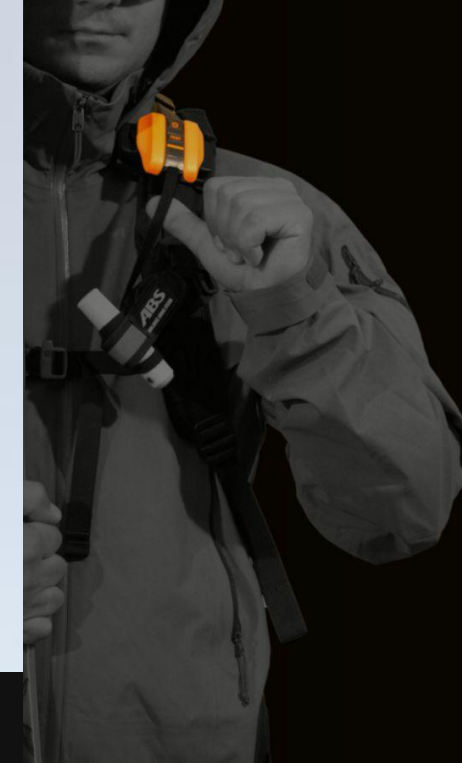
Pomůcka Resero Whistle



- použití GSM a bezdrátového propojení pro vyslání nouzové zprávy pro vlastní nouzový kontakt nebo pro místní záchranný tým s přesným místem a datem
- připojení na batoh, bundu, pásek



- 1 In emergency, user pulls the RW trigger, which sends message to RC Cloud through GSM, or LoRa network
- 2 Message includes user's GPS coordinates and personal data, uploaded in advance by user via Resero App. Message is then automatically redirected to rescue team next to the accident or emergency numbers provided by the user
- 3 RC Cloud database securely stores user data and rescue contacts
- 4 In addition of receiving info about accident Rescue team can benefit from online tracking and search of RW users via LoRa signal. It can be done also with equipment deployed at rescue vehicle or helicopter



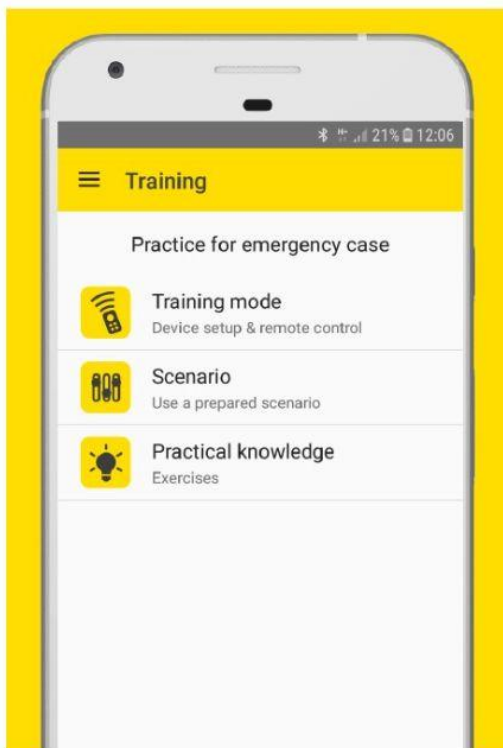
Pomůcka ProtoGear A*LIVE

- „A*Live je prvním SmartSafety nástrojem se stoprocentně celosvětovým pokrytím a satelitní technologií zasílání zpráv“



Pieps – novinky v lavinovém tréninku

- U Pieps vše řešeno uživatelsky přes aplikaci v mobilním telefonu a BT



PIEPS APP

The PIEPS APP provides uncomplicated device management from your mobile phone using Bluetooth. Download the APP connect to PIEPS MICRO BT, PRO BT or POWDER BT and use all the functions.

- ✓ Check your PIEPS beacon
- ✓ Update to latest version
- ✓ Practical knowledge & exercises
- ✓ Practice for emergency case. Use your phone as remote control.

PIEPS APP



PIEPS POWDER BT

Pieps – novinky v lavinovém tréninku

- 3x Pieps Micro + training pads



Kdo byl také na ISPO 2018? ☺



ISSW 2018 Innsbruck



THURSDAY OCTOBER 11, 2018			FRIDAY OCTOBER 12, 2018		
GENERAL TOPICS			GENERAL TOPICS		
Snowpack: Stability and variability Avalanche forecasting MORNING BREAK 9:45-10:15			Human factors: Risk and strategies Education and rescue MORNING BREAK 9:45-10:15		
					
 LUNCH BREAK			 LUNCH BREAK		
SPECIAL TOPIC	SPECIAL TOPIC	TRAINING COURSE	SPECIAL TOPIC	SPECIAL TOPIC	TRAINING COURSE
Operational forecasting tools Avalanche accidents Avalanches and law COFFEE BREAK 14:45 - 15:15		Weather to snowpack stability Mountain weather	Hazard communication and perception Information technologies Terrain-based decision making COFFEE BREAK 14:45 - 15:15		Decision making on-site Medical aspects of avalanche burial

ISSW 2018

- Vzdělávání, vývoj, lokální odlišnosti
- Rozhodovací strategie, jejich přehled, využitelnost, znalost ze strany horských vůdců a veřejnosti
- Lavinové nehody včetně historických (rok 1965 v Rakousku, rok 1370 v Rusku)
- Lavinová předpověď, její variabilita v rámci jednoho státu, regionální, podle sloužícího lavinového preventisty
- Využitelnost sociálních médií
- Použití mobilních telefonů s GPS k mapování chování lyžařů a snowboardistů ve volném terénu
- Příspěvky k využití SPT

Avalanche forecasting is hard.



international snow science workshop
ISSW2018

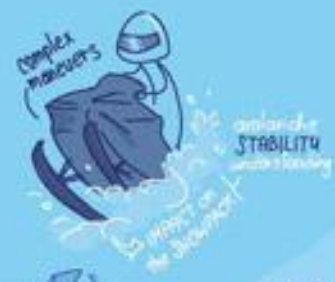
October 07-12 INNSBRUCK

ISSW
2018
INNSBRUCK





THU
OCT 08



Snowpack Stability & Variability



STRATIGRAPHY

INDICATES 4-6 MEASURES



AVALANCHE FORECAST



AVALANCHES/LEVEL

Quantifying the Obvious



REGIONAL vs LOCAL



AVAILANCHE ACCIDENTS



LONG LASTING CONSEQUENCES



LOCAL AVALANCHE DANGER ASSESMENT IN REDUCED MEANS CONTEXT: AN EXEMPLE IN TETNULDI SKI AREA (GEORGIA – CAUCASUS)

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² Compagnie des Alpes Management CDAM Deux-Alpes Loisir, 38860 Les Deux-Alpes, FRANCE

³ Compagnie des Alpes Management (CDAM) International, 50-52 bd Haussmann 75009 Paris - FRANCE

ABSTRACT: The development of Georgians ski resort involves several skills, including local avalanche danger assessment. Human organization and financial context limit possibilities of the Georgian ski resort to simple but efficient solutions. A technical cooperation between Anena and CDAM (Compagnie des Alpes Management) lead to this goal through a training program during winter 2017-2018 in Tetnuldi (Georgia - Svanetia).

We have developed a method suitable for Georgian ski patrollers team to assess an avalanche risk level and communicate it to their guest.

The logic adopted is to rely for the different stages of the process on existing international tools: from Switzerland (*Avalanche Problems Analyzer*) and Canada (*ATES classification of the terrain : simple, challenging, complex*). A specific synthesis grid « local Avalanche Danger Assessment » have been built on three criteria: what avalanche Problem? (for everyone, a ranking from *favorable* to *unfavorable* - green: risky 1 to red: risky 4), where are the problems located (for each situation: aspect, elevation, particular configuration), observable (local observations: avalanche activity, accumulations).



Figure 1: The location of Svaneti , 300 km North-East of Georgia's capital Tbilissi,



Tetnuldi : main Off-piste areas (2018)

Avalanche terrain classification (ATES method) :

- 1 **Simple** (less than 30°, no directly dominated)
- 2 **Challenging** (30° slopes, some terrain trap)
- 3 **Complex** (long 30° slopes, gullies, upper part of a face...)

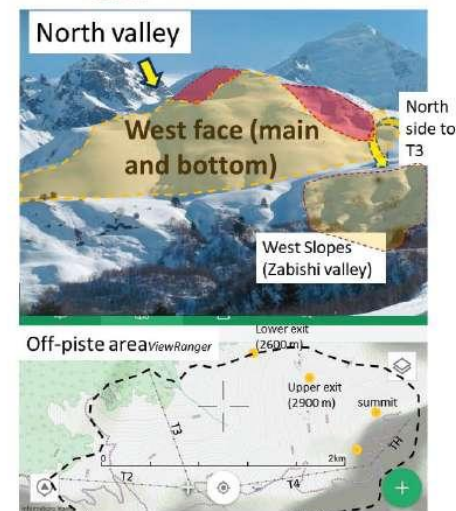


Figure 3: Representation of the ATES classification in Tetnuldi ski-area



Figure 7: Georgian ski patroller give information to guest by using an information panel (in the back) and the "Local Avalanche Danger Assessment" form (on his hand)



Figure 8: Risk information panel (existing in two places in the ski-area) using international Avalanche Danger Symbolic; details are given by drawing on the bottom part : description of main avalanche problems, localization and specific observation of the day.

AVALANCHES IN BULGARIA – HUMAN AND NATURE PERSPECTIVE

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² Bulgarian Extreme and FreeSkiing Organization (BEFSA)

ABSTRACT: Avalanches were recognized as disturbance in the alpine and subalpine environment in Bulgaria. However, before the 1930s mostly forest workers were interested in the phenomena due to forest damages and accidental death of personnel. In few periods with high avalanche activity which caused damages in forests there was scientific attention and reports. However, newer development of remote sensing techniques provides affordable opportunities to better study the importance of avalanches as forest disturbance. After the development of the tourist movement in the 20th century encounters of people with avalanches frequented and lead to several tragic accidents. Attention in avalanches increased after a tragic event in 1965, when 11 mountaineers were killed in a single accident close to Malyovitsa peak in the Rila Mountains. For the whole period of records (1930s to present) a total of 99 avalanche accidents were recorded with above 230 people involved, of which 60 fatalities. In recent decades the raise in the number of freeride skiers and snowboarders lead to higher incident rate. In these groups were recorded 75% of all 58 accidents involving 108 people after 2000. Most of the successful rescues of completely buried people were due to quick and adequate reaction of people on the scene. Only few of the organized rescue operations resulted in digging out alive people, although several of those cases were remarkable. The data although limited and preliminary demonstrates high importance of proper reaction in avalanches and especially of adequate companion rescue.



Figure 1. Number of involved people in avalanche accidents in Bulgaria

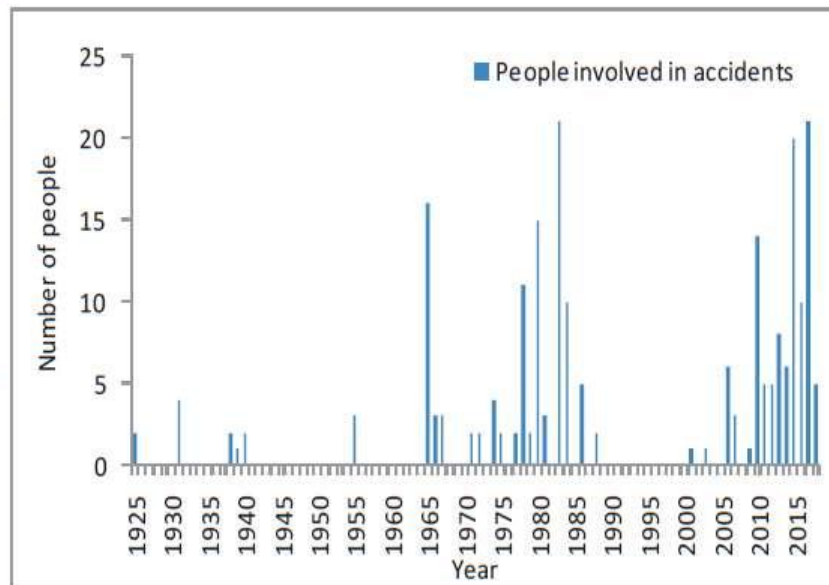
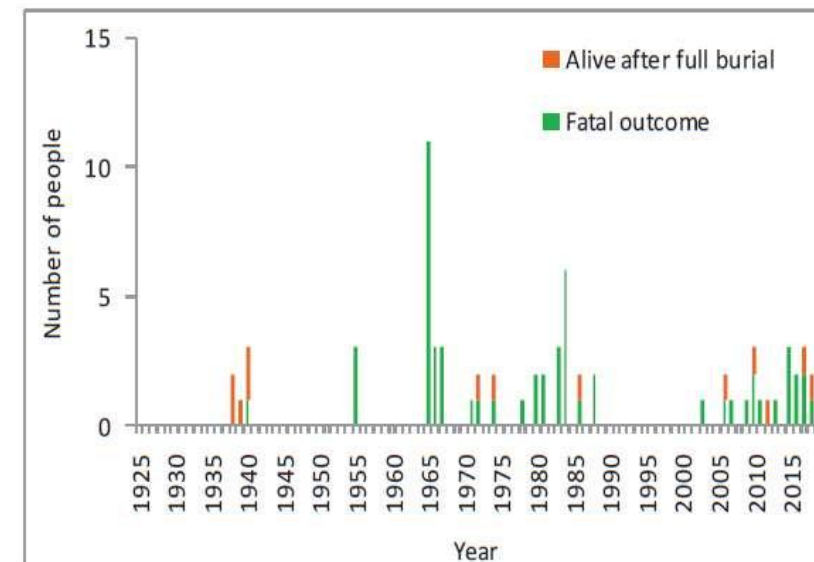


Figure 2. Number of people who died in avalanche accidents and number of rescued alive after complete burial in Bulgaria



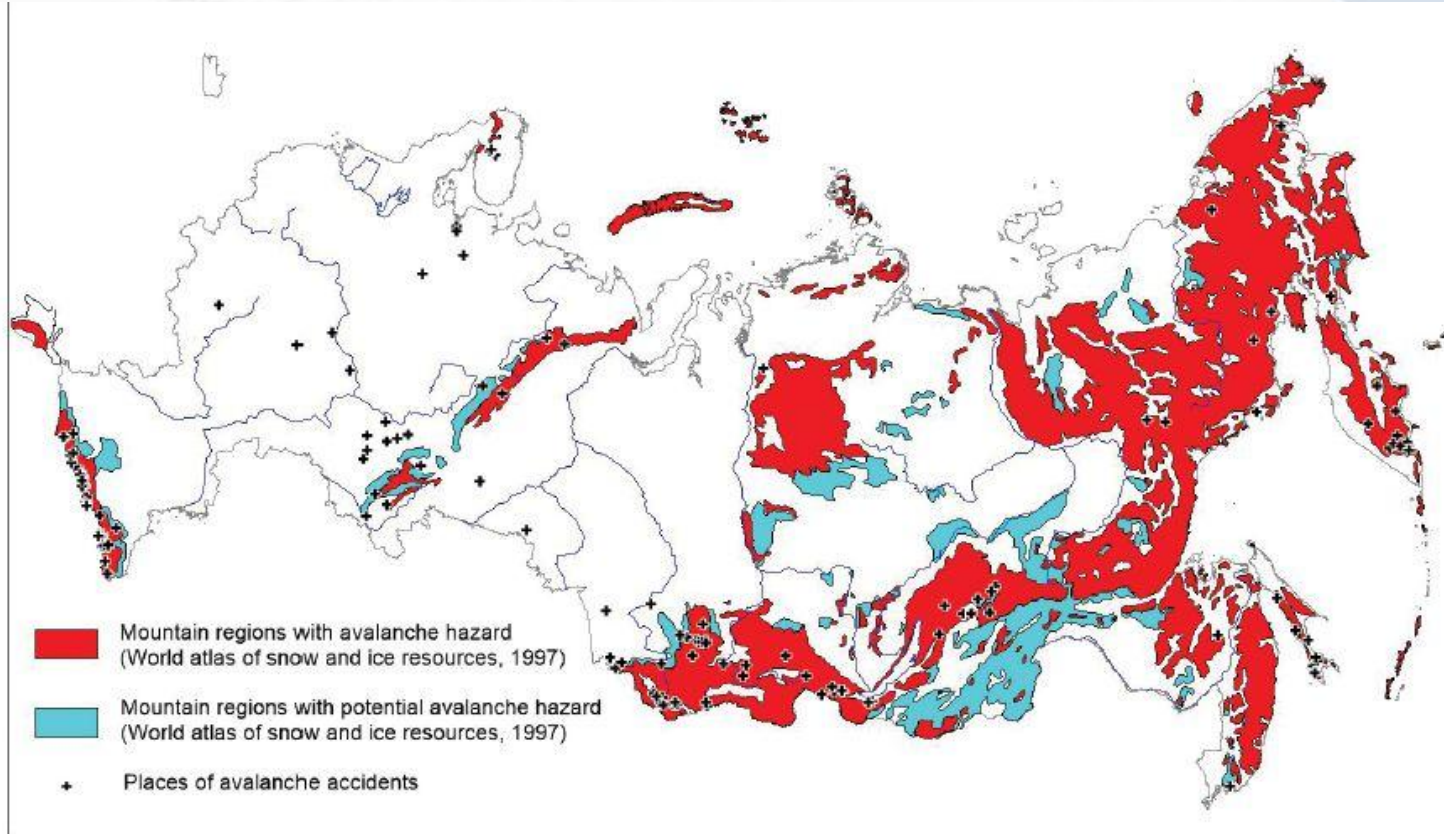
AVALANCHE ACCIDENTS IN RUSSIA

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2 - High-Mountain Geophysical Institute, Nalchik, Russian Federation

ABSTRACT: We have collected information about avalanche disasters on the territory of Russia for the period of 1996-2017. The analysis of spatial distribution, the social structure of the victims is carried out. Time dynamics of avalanche disasters is determined. The meteorological conditions of avalanches formation caused victims are estimated.



The most complete data on avalanche accidents that was collected correspond to the period of 1996-2017. During this time at least 219 avalanches led to human victims in Russia. The total amount of 669 people got to avalanches, 413 of them died. Thus, every season there are 10 avalanche accidents on average and the average number of victims is 20 people in our country.

Figure 1: Spatial distribution of catastrophic avalanches in Russia from 1996-2017.

ARE HAND-HELD INFRARED THERMOMETERS AND CAMERAS USEFUL FOR AVALANCHE FORECASTING? FOR AVALANCHE EDUCATION?

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¹ Snowline Associates Ltd., Calgary, Alberta, Canada

² Northwind Avalanche and Weather Services, Whitehorse, Yukon Territories, Canada

ABSTRACT: This paper presents new results for measuring the temperature of the snow surface (Tss) with hand-held infrared (IR) thermometers and of the pit wall with IR cameras, and identifies limitations including adjustment of IR thermometers to ambient temperature, as well as radiative and turbulent heat transfers during the exposure time of the pit wall. Avalanche forecasting operations have three objectives for Tss measurements: 1) an indication of near surface faceting, 2) day-to-day change in Tss, and 3) the current temperature difference from the melting point. We identify constraints that limit the value of IR or contact thermometers for these objectives. However, we propose that IR measurements of Tss over terrain variations in aspect, slope angle, windy vs sheltered, and sunny vs shady surfaces are valuable for teaching – and for developing an intuitive sense of – surface heat transfer over terrain. Avalanche forecasting operations are interested in the vertical temperature profile in the snowpack and especially in gradients adjacent to crusts. We took horizontal averages of IR pixels of a shaded pit wall and measured temperature changes of 1°C within a minute after exposing the pit wall. Temperature gradients also changed substantially within minutes. In contrast to the limitations of IR images of pit walls for avalanche forecasting, such images have considerable value for avalanche education. We show images that illustrate stronger temperature gradients in shallow areas and normal to the slope, heat flow along depth hoar chains, and the dependence of near surface temperature gradients on heat transfers at the surface.

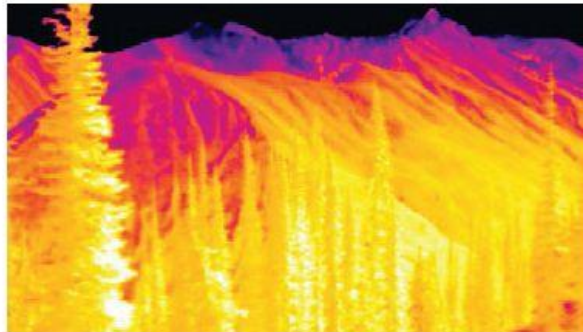


Figure 4: Afternoon image from an IR camera pointed south towards Mt. Smart in Glacier National Park, BC. Ucalgary.ca/ASARC image.

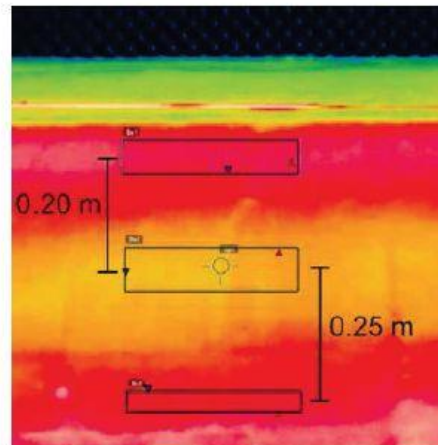


Figure 5: Pit wall exposed for ~40 seconds before first IR image, showing top, mid and lower rectangles. The horizontal rectangles minimize the effect of the vertical scoring from shovelling.

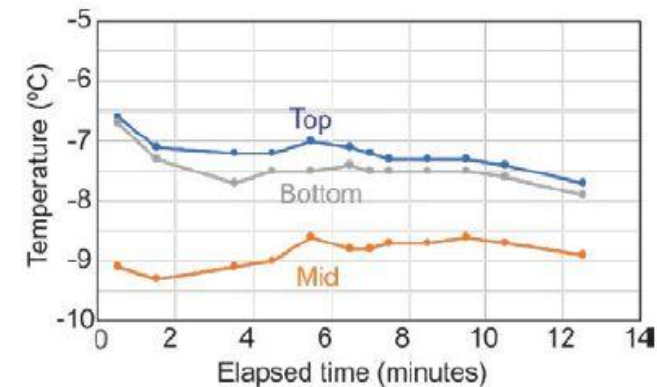
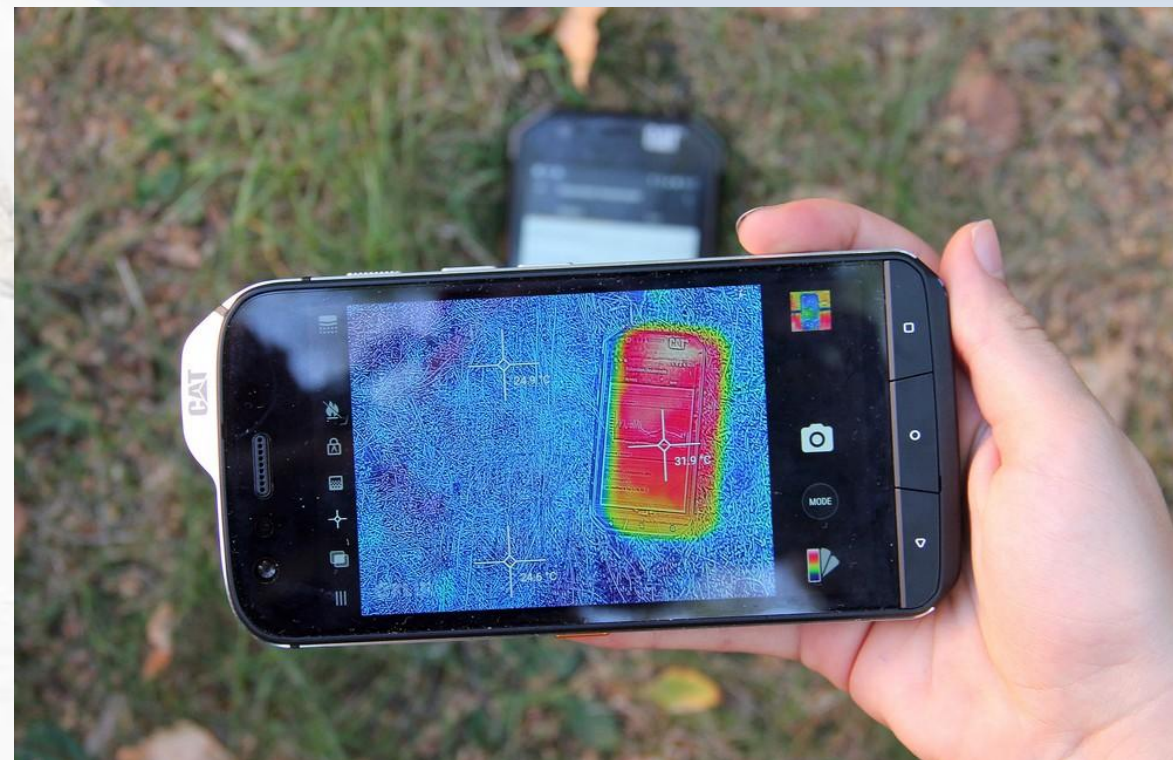



Figure 6: Time series of average temperatures for the top, mid and bottom layers based on 12 IR images.

CAT S61 FLIR modul



FLIR univerzální modul



PRO-GRADE THERMAL CAMERA FOR SMARTPHONES

FLIR ONE Pro

MODEL: FLIR ONE PRO - ANDROID (USB-C)

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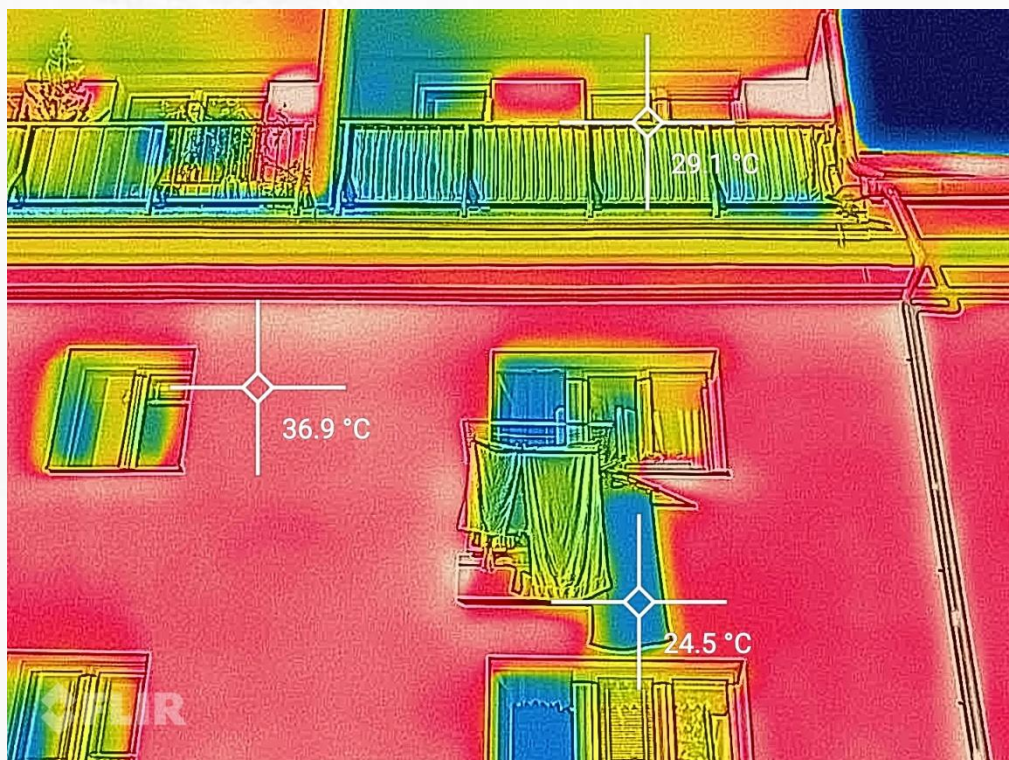
The FLIR ONE Pro helps you find invisible problems faster than ever, whether you're inspecting electrical panels, troubleshooting mechanical systems, looking for HVAC problems, or finding water damage. This FLIR ONE Pro-Series camera offers 4x the native resolution of the FLIR ONE Pro LT, for sharper image clarity that's further enhanced by the revolutionary FLIR VividIR™ image processing. Measure temperatures more than 3x higher than any FLIR ONE model—up to 400°C (752°F)—with a sensitivity that detects temperature differences down to 70 mK. Packed with powerful measurement tools, the FLIR ONE Pro will work as hard as you do.

PRODUCT VARIATIONS:

FLIR ONE Pro – Android (USB-C) ▼

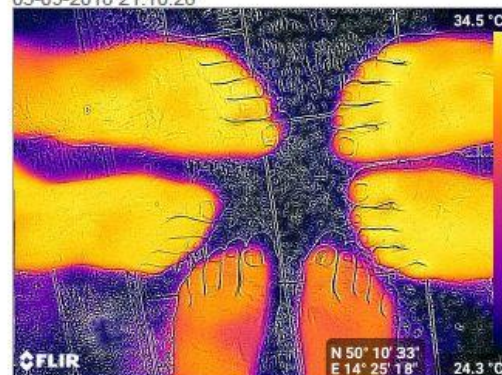
\$399.99

CAT S61 FLIR modul



FLIR Thermal Image Report

05-09-2018 21:10:28



Latitude: N 50° 10' 33", Longitude: E 14° 25' 18"
flir_20180905T231105.jpg

05-09-2018 21:10:28



Latitude: N 50° 10' 33", Longitude: E 14° 25' 18"

Parameters

Emissivity	0.90
Refl. temp.	25.00 °C
Distance	0.48 m
Relative humidity	50.00 %
Atmospheric temp.	20.00 °C
Transmission	0.00
IR window temp	30.80 °C
IR window trans.	0.82
Latitude	N 50° 10' 33"
Longitude	E 14° 25' 18"