

Draconids 2011 by the all-sky camera AMOS

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AMOS - All-sky Meteor Orbit System

- from AGO CU
- Sigma DG Fisheye 15mm, F2.8
- Image intensifier XX1332, Photonis
- Meopta Video Opticon 1.4 / 16
- DMK 41BU02, ImagingSource



ITMN, PFN, CEMeNt, SVMN - 9 stations



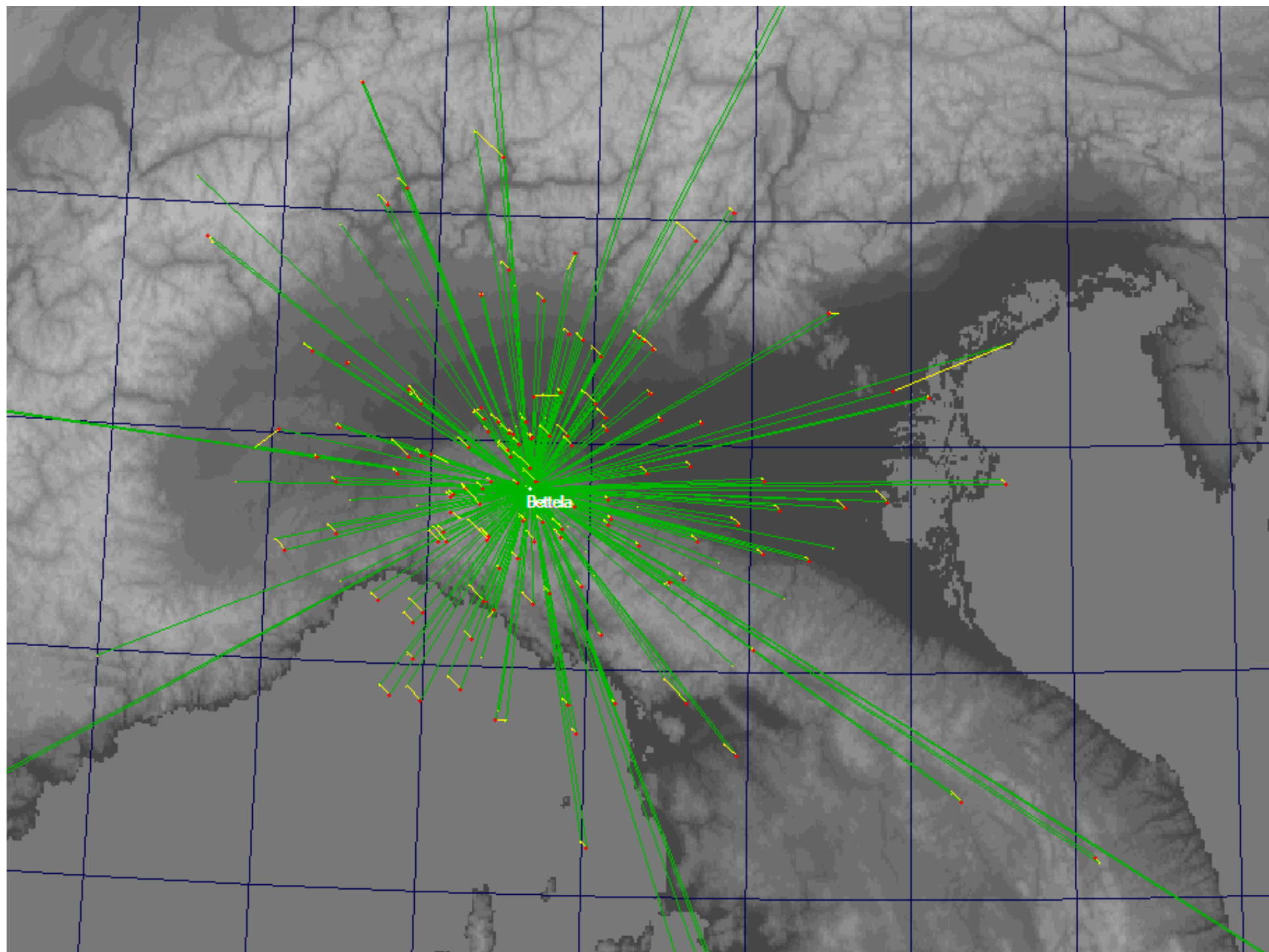
Stations

- **IMTN** - Italian Meteor and TLE network (5 stations)
- **PFN** - Polish Fireball Network / Pracownia Komet i Meteorów, PKiM (2 stations)
- **CEMeNt** - Central European Meteor Network, Czech and Slovak AA (1 station)
- **SVMN** - Slovak VideoMeteor Network, CU (1 station)

Bettola, Italy

Gajdoš, Világi (SVMN), Piffli (CEMeNt)





Processing of data

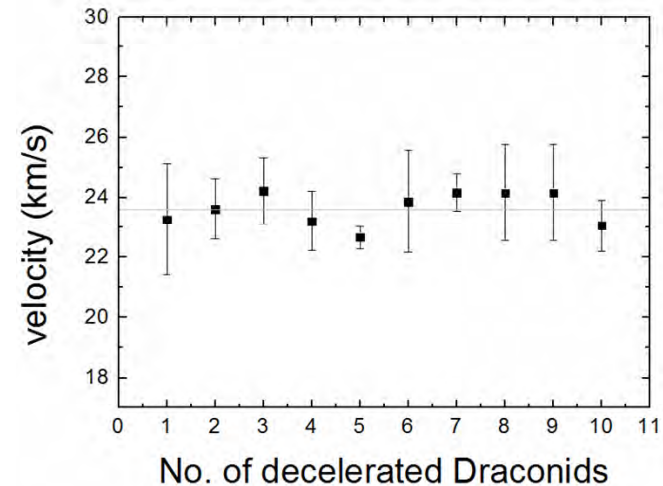
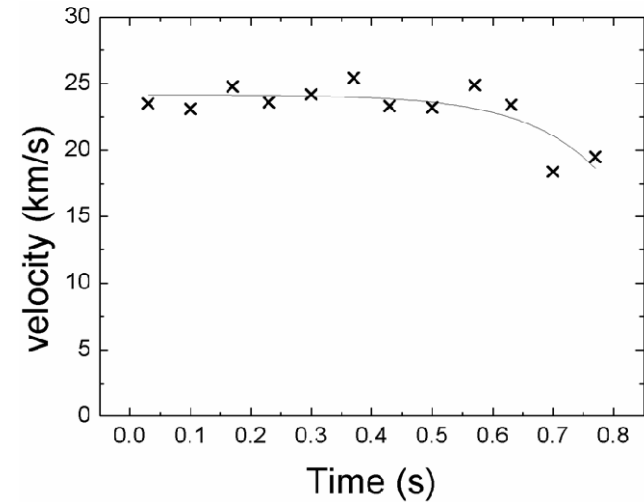
- most of stations UFO Tools
- two Polish stations MetRec – then converted to UFO format
- orbits computed by UFOOrbit

Preliminary results

- 62 Dra identified 17:56 - 23:22 UT
 - radiant elevation 68 - 29 deg
- 43 Dra with sufficient precision
- 19 excluded
 - convergence angle
 - small number of meteor positions
 - other astrometrical issues

Velocity derivation

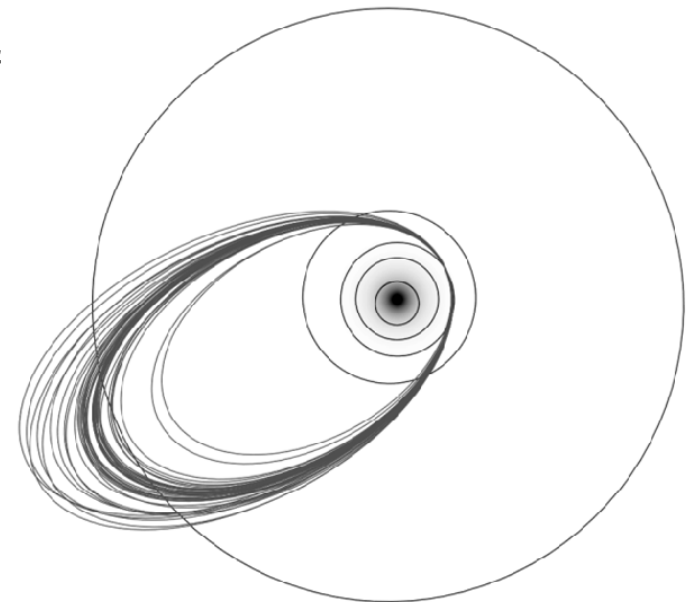
- strong fragmentation and deceleration
 - measurement of velocity problem
- assumed initial velocity **23.57 km/s**
 - by Koten et al. (2007)
 - photographic fireball in 2005
 - assumption is supported by 10 well Dra in our records
- more detail analysis will be done



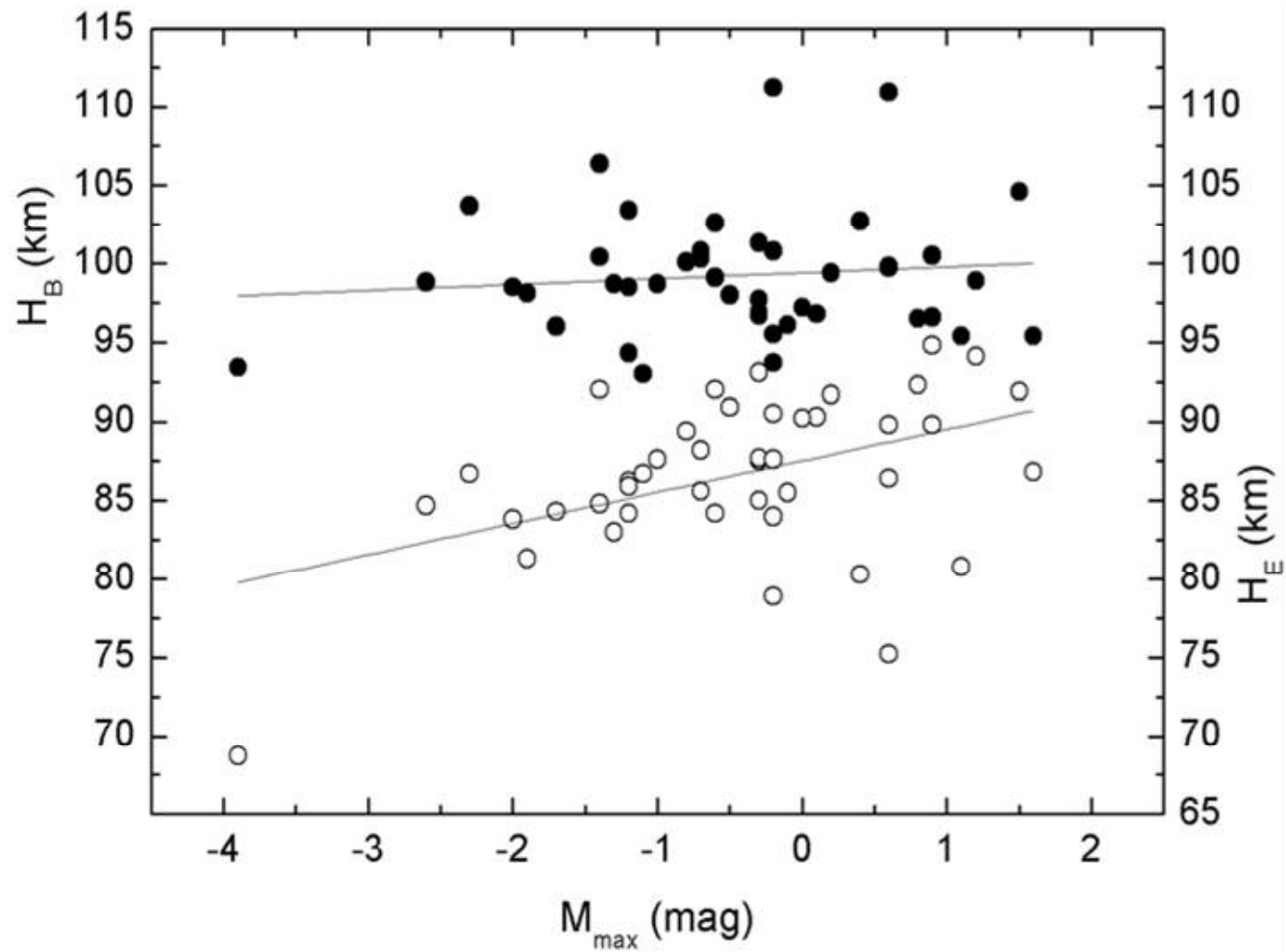
Mean orbit of Draconids from 9 stations (Italy)

	a (AU)	q (AU)	e	i (°)	ω (°)	Ω (°)	α (°)	δ (°)
Mean value	3.58	0.9964	0.720	31.70	173.51	194.944 - - 195.167	263.25	55.61
std	± 0.29	± 0.001	± 0.023	± 0.34	± 1.10		± 1.47	± 1.00
Comet 21P	3.52	1.0320	0.707	31.91	172.57	195.403	263.20	55.80

Comet 21P integrated from epoch 1900 to epoch of observation. Orbit from JPL.



Beginning and terminal heights



The first European meteor observation airborne campaign

J. Vaubaillon (IMCCE, PI)
J. McAulliffe (INSA/ESA)
D. Mautet (USU)



P. Koten (Ondrejov obs, PI)
J. Zender (ESA)
J. Toth (Univ. Bratislava)



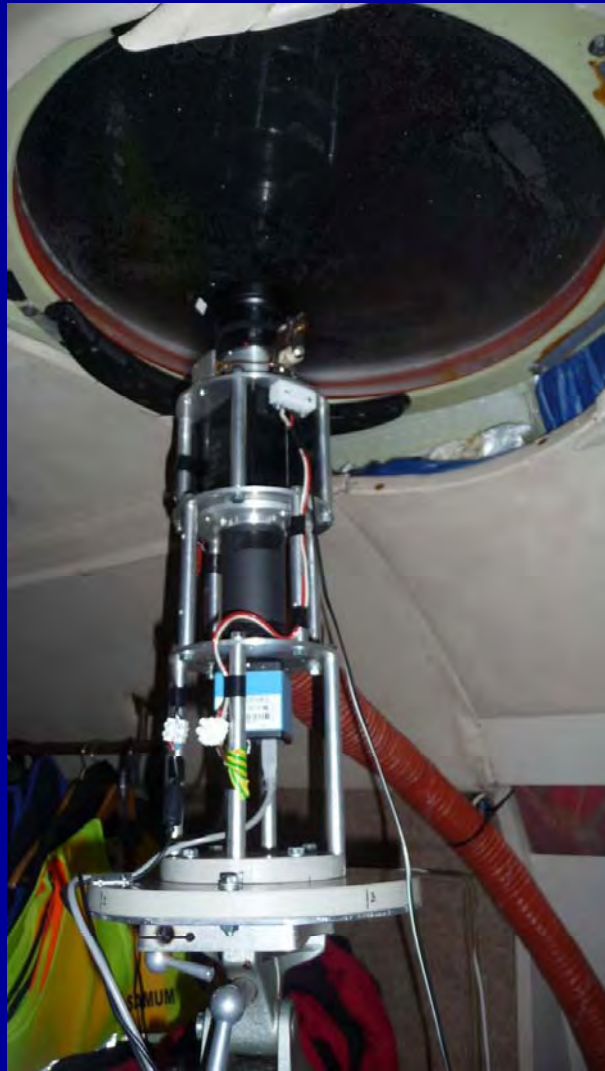
The atmosphere is our laboratory
AIRBORNE ENVIRONMENT RESEARCH SERVICE

Ground observation from Kiruna

- the expected first peak observed from Kiruna airport (AMOS)
 - time interval 17:00 - 18:28 UT
- 16 Draconids and 5 sporadic meteors
 - no second-station meteor in the Swedish ALIS cameras of Aurora Research

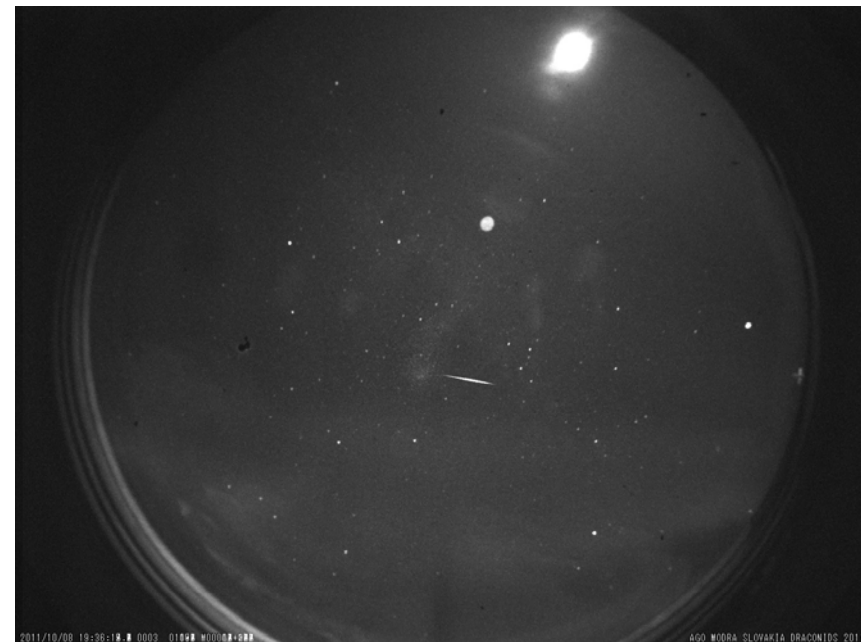
Airborne observation

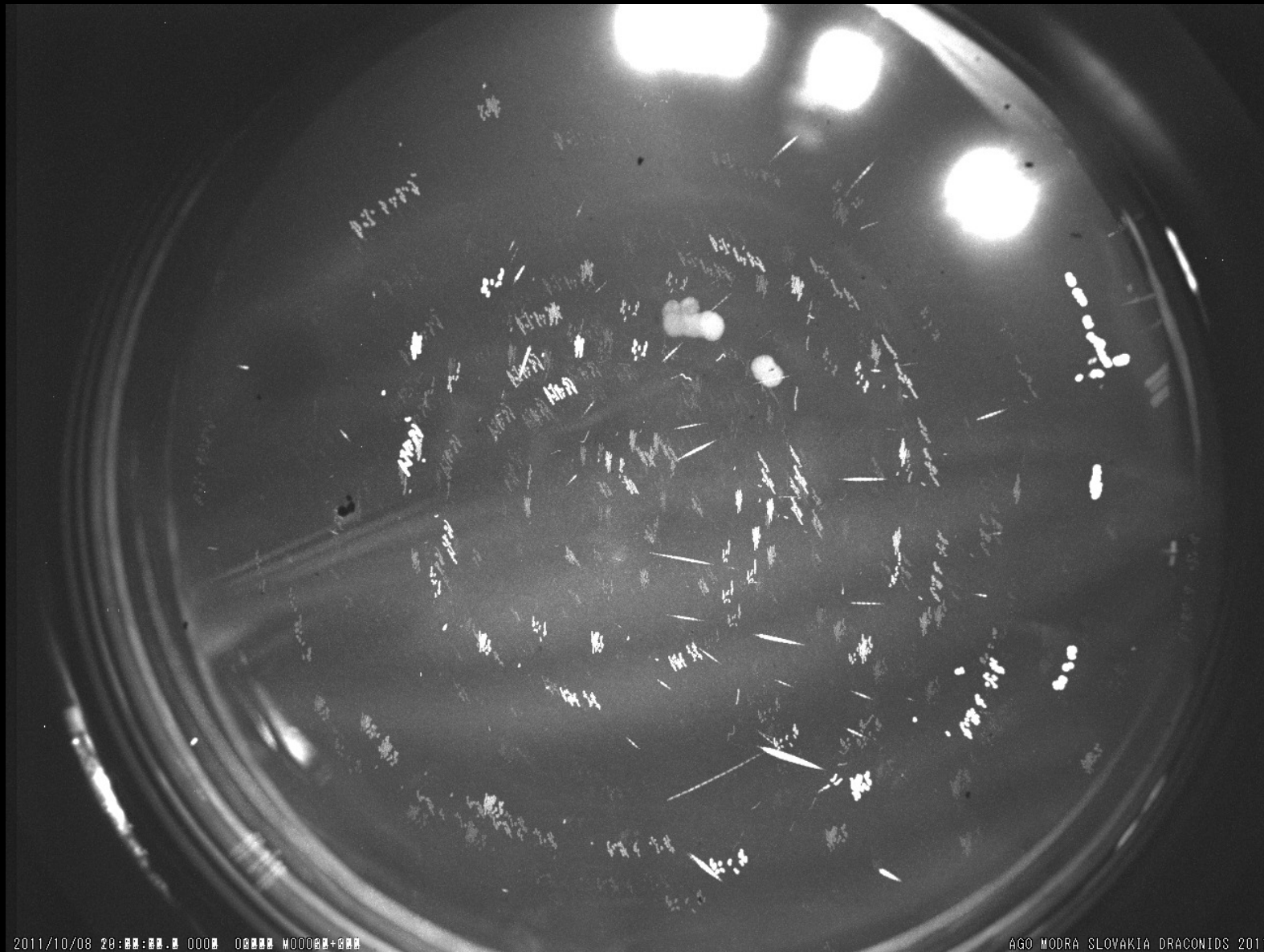
Kiruna, Sweden, Oktober 8th, 2011



Airborne observation

- time interval 19:15 - 21:44 UT
 - blackout between 20:12 - 20:28 UT
- turbulence caused the movement of the sky background
 - 2 min clips + break to save
- AMOS contains also the image intensifier
 - high background - full Moon, aurora (after 21 UT)





2011/10/08 20:00:00.0 0000 M0000+000

AGO MODRA SLOVAKIA DRACONIDS 2011

Processing of data

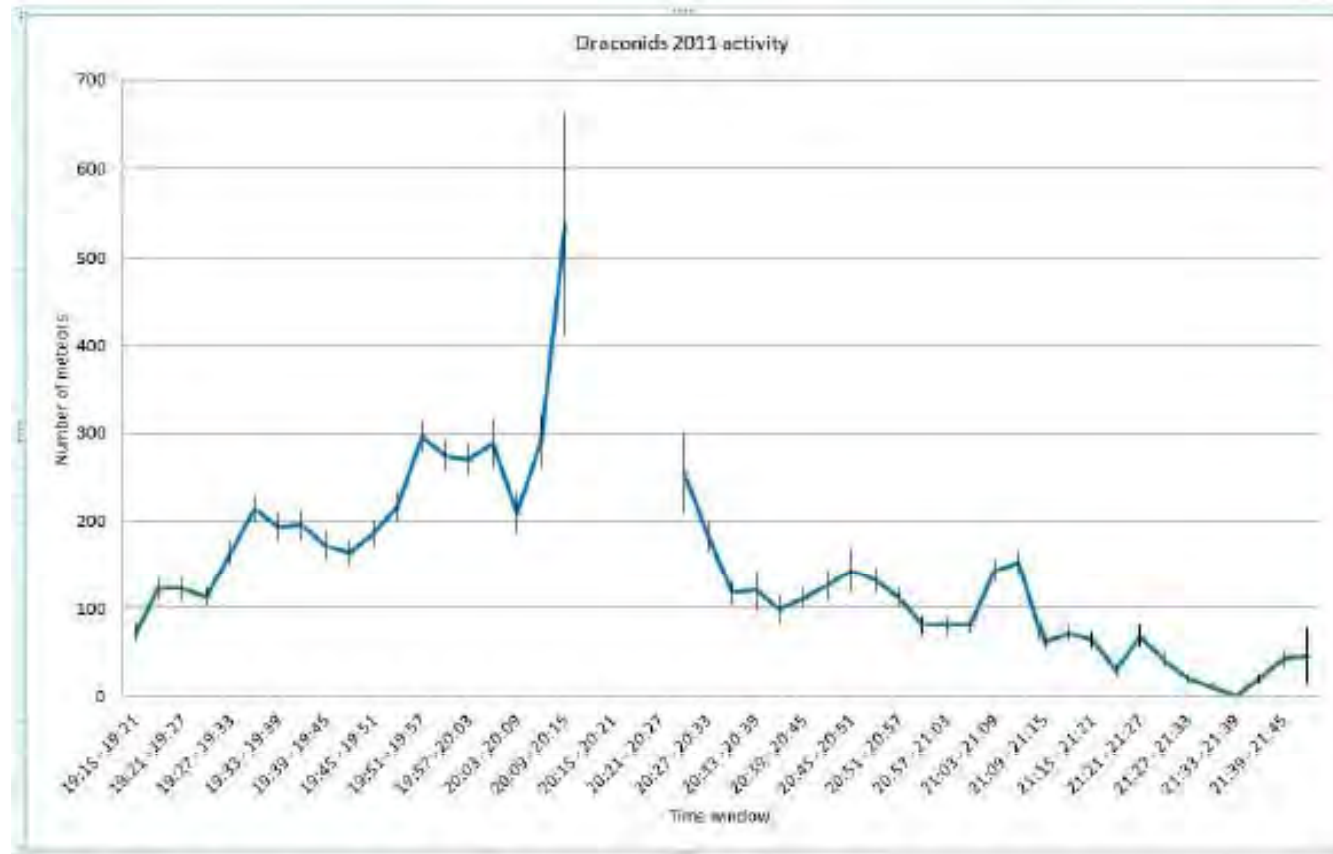
- detection of meteors manually
 - high background, sw did not work
 - HandyAvi (<http://www.azcendant.com/>)
 - UFOCapture (SonotaCo, (2009)
- short clips containing only meteors
 - 1 sec - meteor - 2 sec
 - Boilsoft Video Splitter (<http://www.boilsoft.com/videosplitter/>)
- astrometry by UFOAnalyzer
 - stacked image
 - one frame - Virtual-Dub software (<http://www.virtualdub.org/>)
 - actual position of camera - airplane from GPS data



Preliminary results

- more than 250 Draconids recorded by AMOS camera
- brightness from -3 to +3 mag
- astrometric data corrected
 - precession, nutation, aberration
 - to join with France / Safire aircraft
 - compute orbits
- activity profile - 6 min. time interval
 - influenced due to aurora phenomena, mainly after 21 UT
 - ZHR could not be derived

Activity profile from airborne observation



Thank you