Croatian Meteor Network: data reduction and analysis

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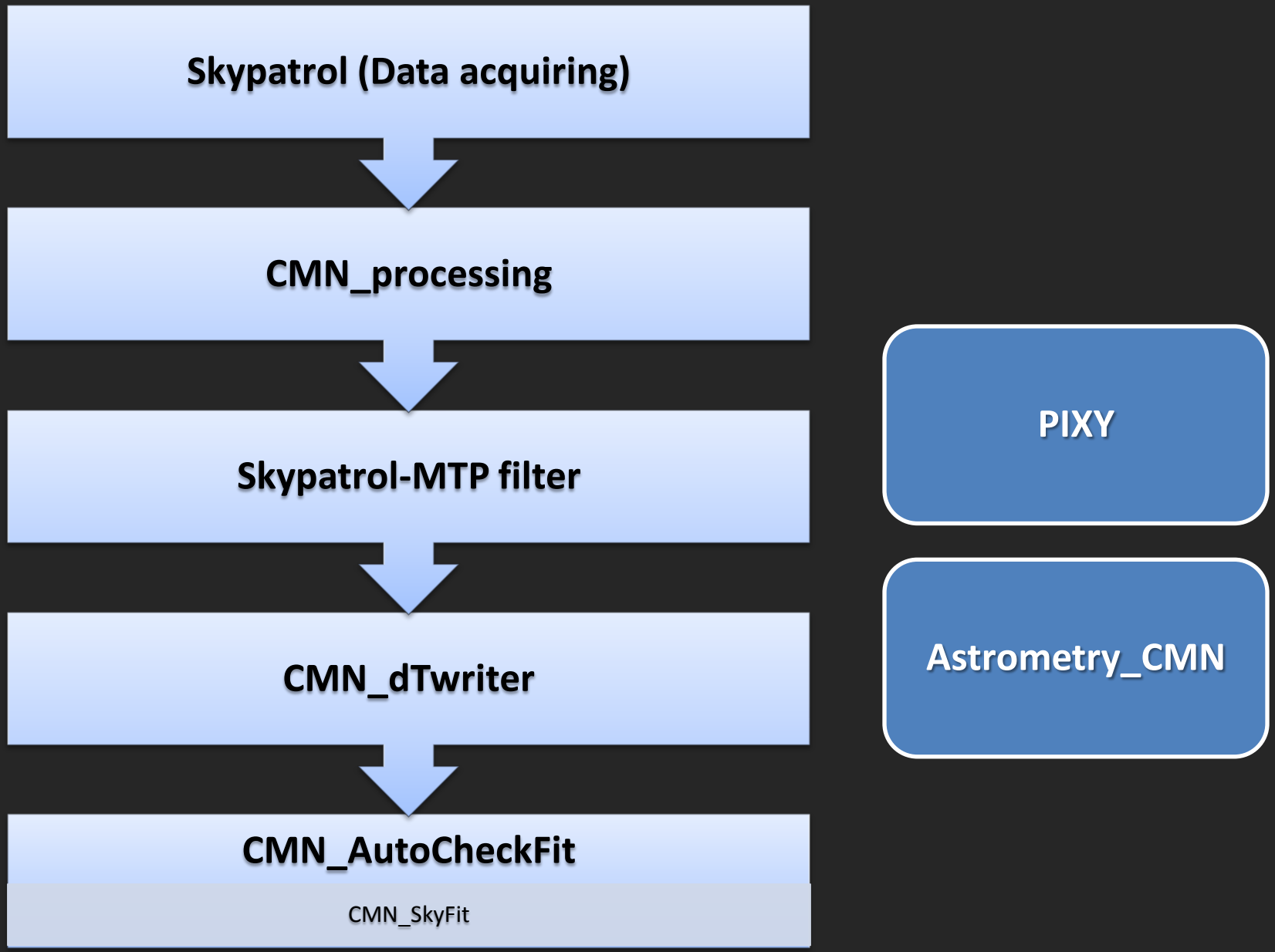
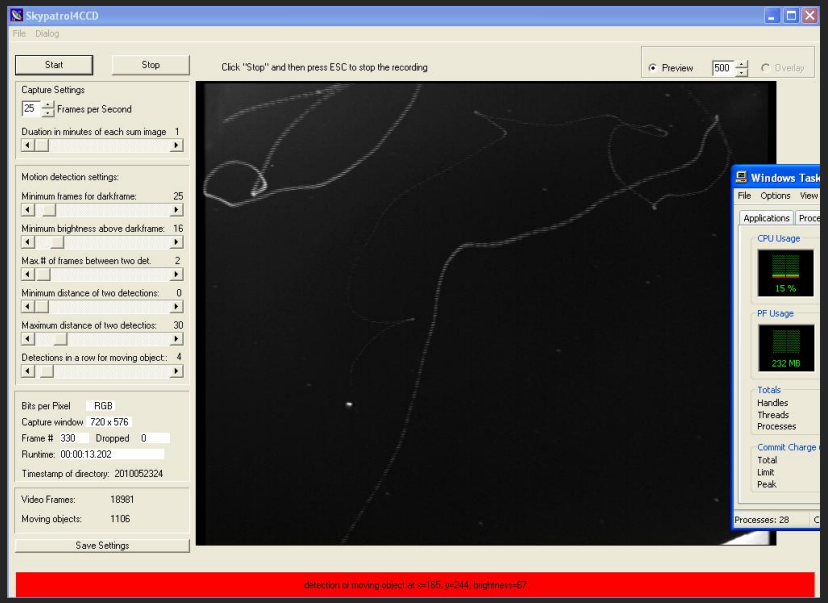
1. Data reduction


Skypatrol (Data acquiring)
CMN_processing
Skypatrol-MTP filter
CMN_dTwriter
CMN_AutoCheckFit
CMN_SkyFit
PIXY
Astrometry_CMN

1.1. Skypatrol → CMN_processing

- Detecting moving objects
- Very low system requirements

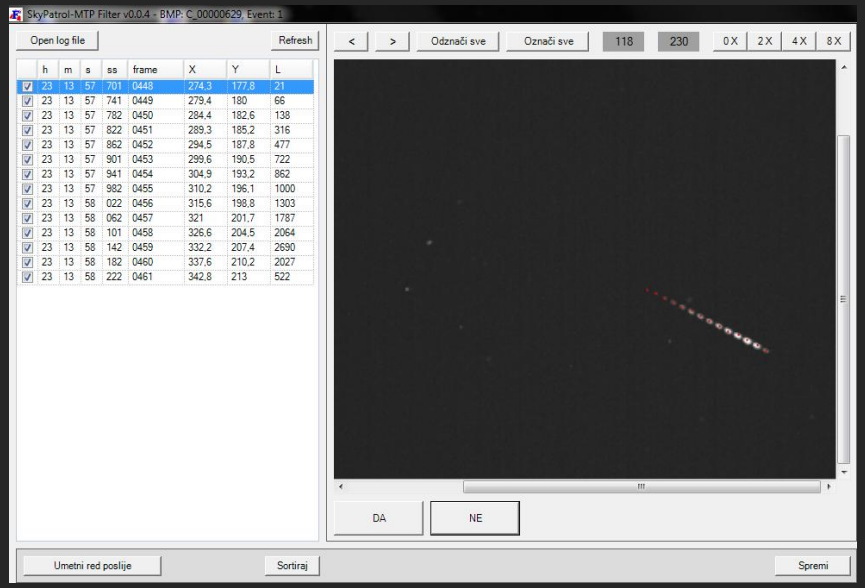


- First data reduction
- MTP_MeteorDetector
  - First data reduction
- MTPFilter
  - Second data reduction
  - Separating meteors from other detections

- Written in Python, uses multithreading (faster processing)

1.2. SkyPatrol-MTP filter → CMN_dTwriter

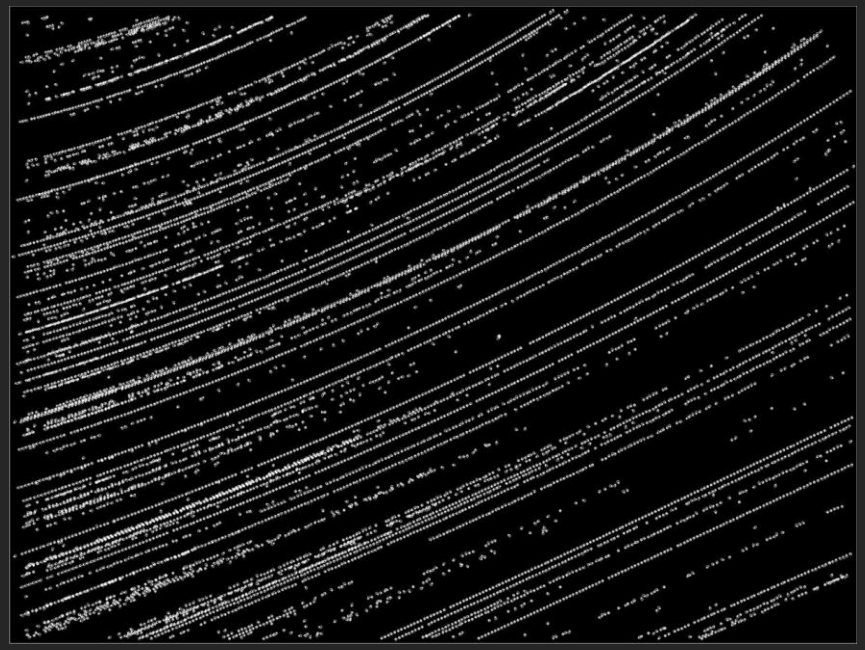
- manual filtering (visual inspection)



- Time synchronization between various stations
- Compares recorded events between overlapping stations → figures out the clock errors
- Referent stations synchronize times via Internet

1.3. Astrometry_CMN → CMN_AutoCheckFit

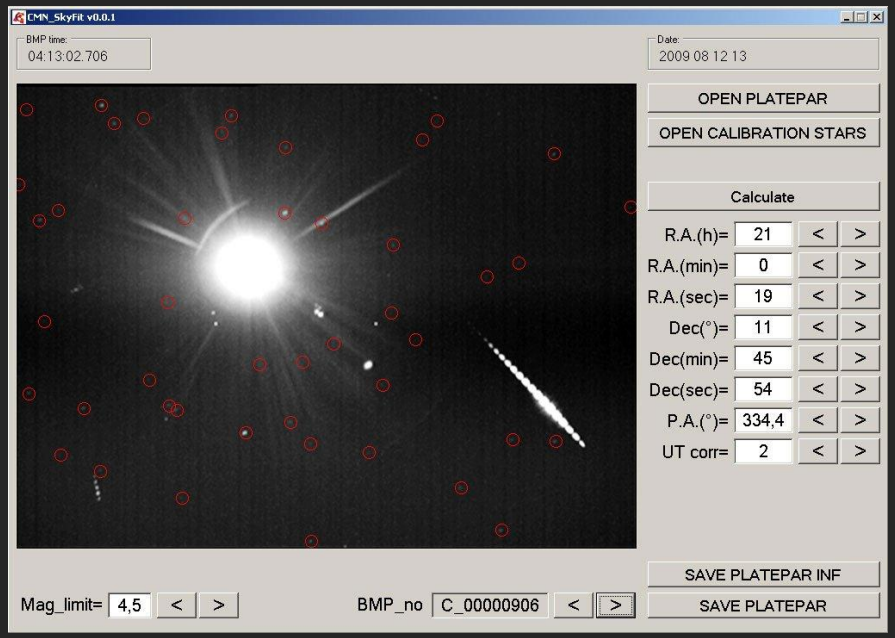
- Astrometric calibration using reference stars
- More images → more reference stars
- 3rd order polynomial fit



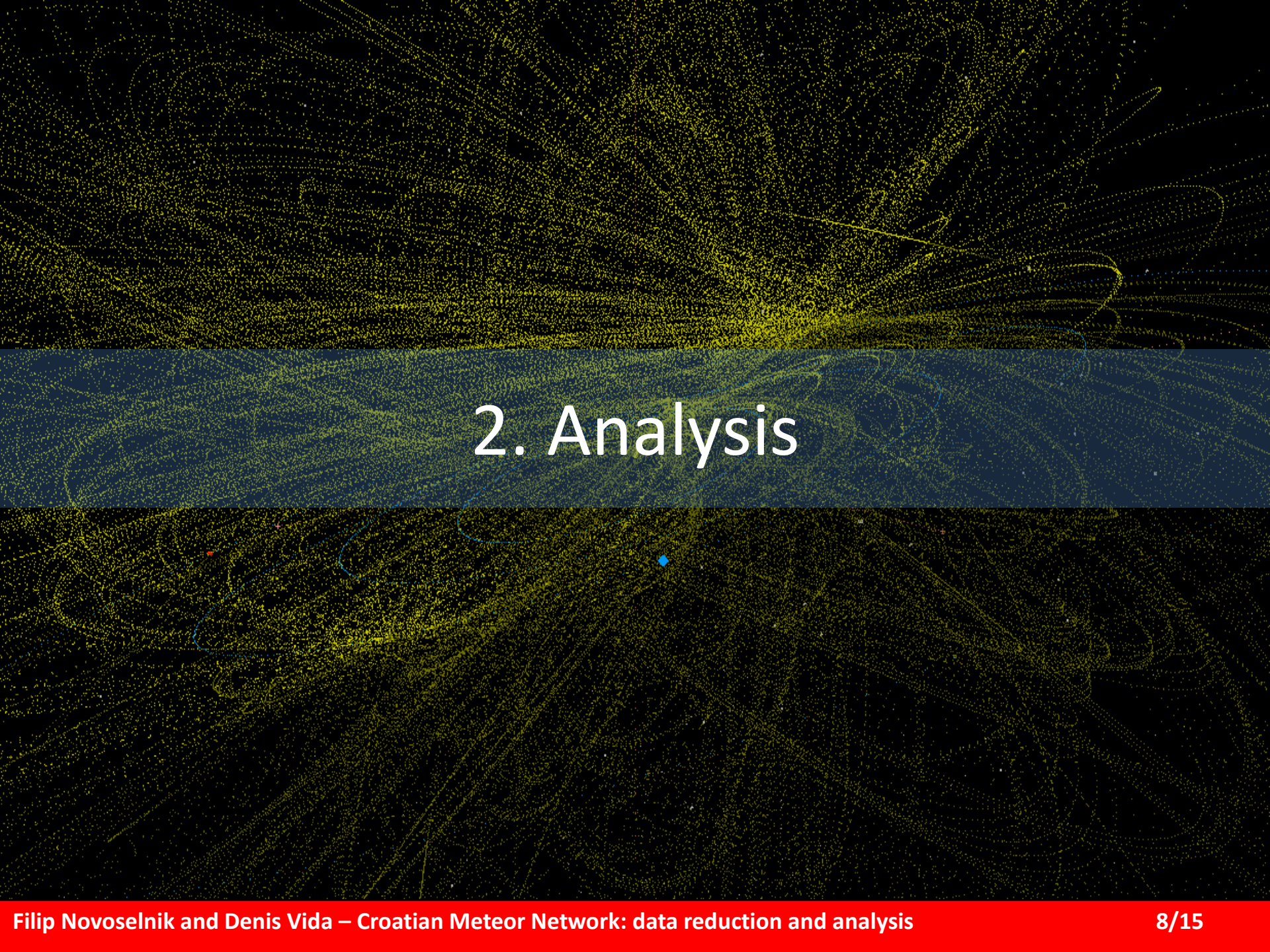
- Checking if calibration file is usable on all nights using AstrometryCheckFit software
- Does coordinate transformations and photometry using CMN_Met_Math software

1.4. CMN_SkyFit & Additional tools

- If calibration file proves not to be suitable, manual checking is possible



- HMM_detectedExtractor
- HMM_ProcessedExtractor
- HMM_updateCheckFitBase
- HMM_CSVextractor



2. Analysis

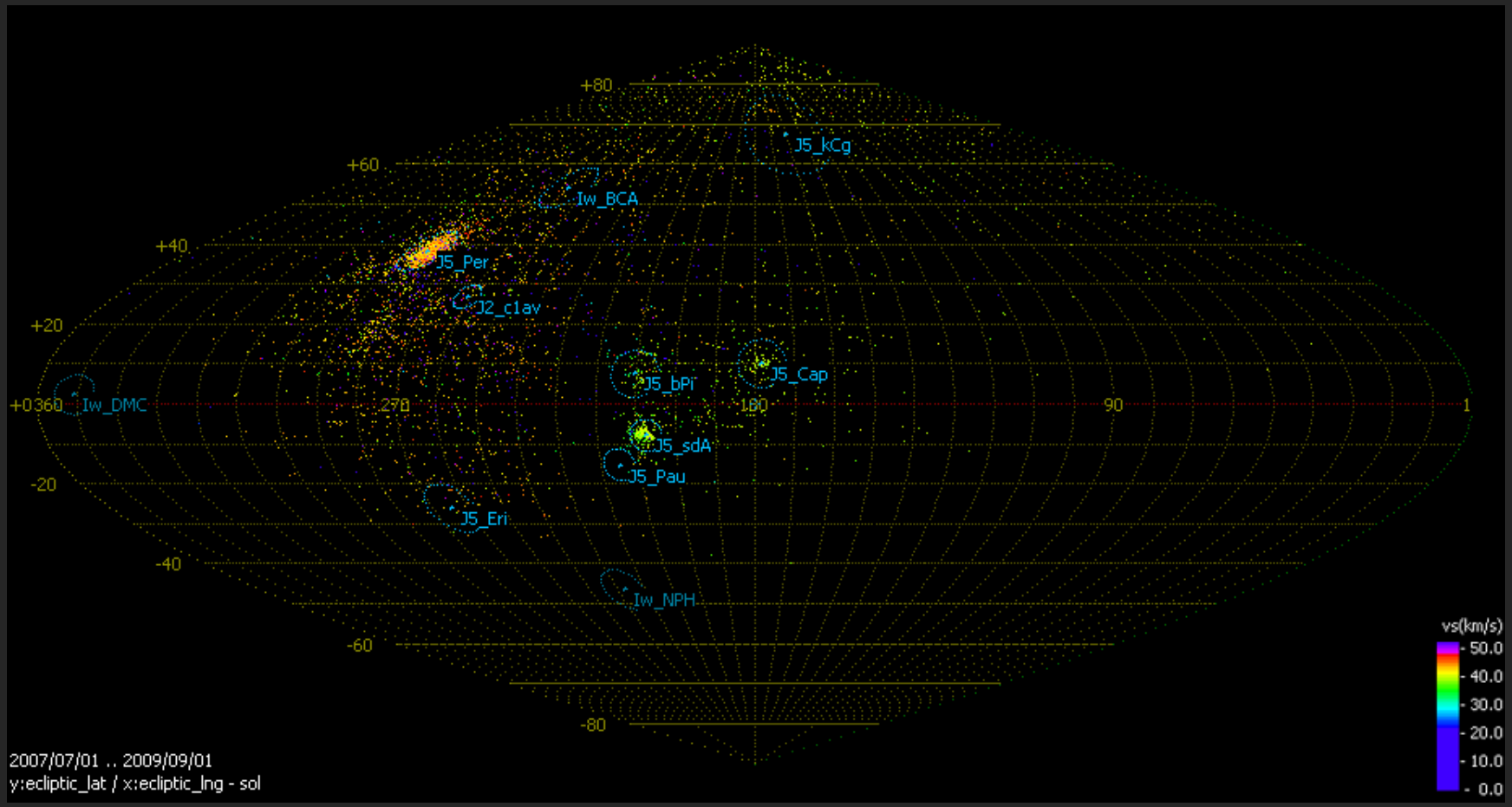
2.1. Observing statistics

- 2007 – 2009 July and August:
  - 31 573 meteors detected
  - 4 235 Q1 orbits

year	month	Rovisce BJA	Merenje MEA	Osijek OSA	Pula_ADIP PUB	Pula_HOME PUA	Rijeka_A RIA	Rijeka_B RIB	Visnjan VID	Tican TIA	Zagreb_RGN ZGR	Varazdin VAA	MaliLosinj MLA	Petrovsko PET	Zrnovnica ZRA	VelikaPisanica VPI	Valpovo VLA	Sibenik_B SIB	BackaPalanka BPA	Brac BRA	Zagreb_Titus ZGT	Varazdin_Alan VAB	Total:
2007	7	165	95	226		488	465				489												**1928**
	8	153	168	145		970	726			142	349												**2653**
2008	7		229	103	374	550		87	225		256	7	83	205	581	158	34						**2892**
	8		1057	790	926	1125	884	467	858		530		498	790	1537	1290	249						**11001**
2009	7		607	131	316	241	41	206	466		280			409	437	99	152	281	73		340	179	**4258**
	8		487	344	554	1132	331	339	825		338		205	673	776	282	553	723	103	315	782	79	**8841**
Total:		318	2643	1739	2170	4506	2447	1099	2374	142	2242	7	786	2077	3331	1829	988	1004	176	315	1122	258	**31573**

Table 1. Number of meteors (by stations)

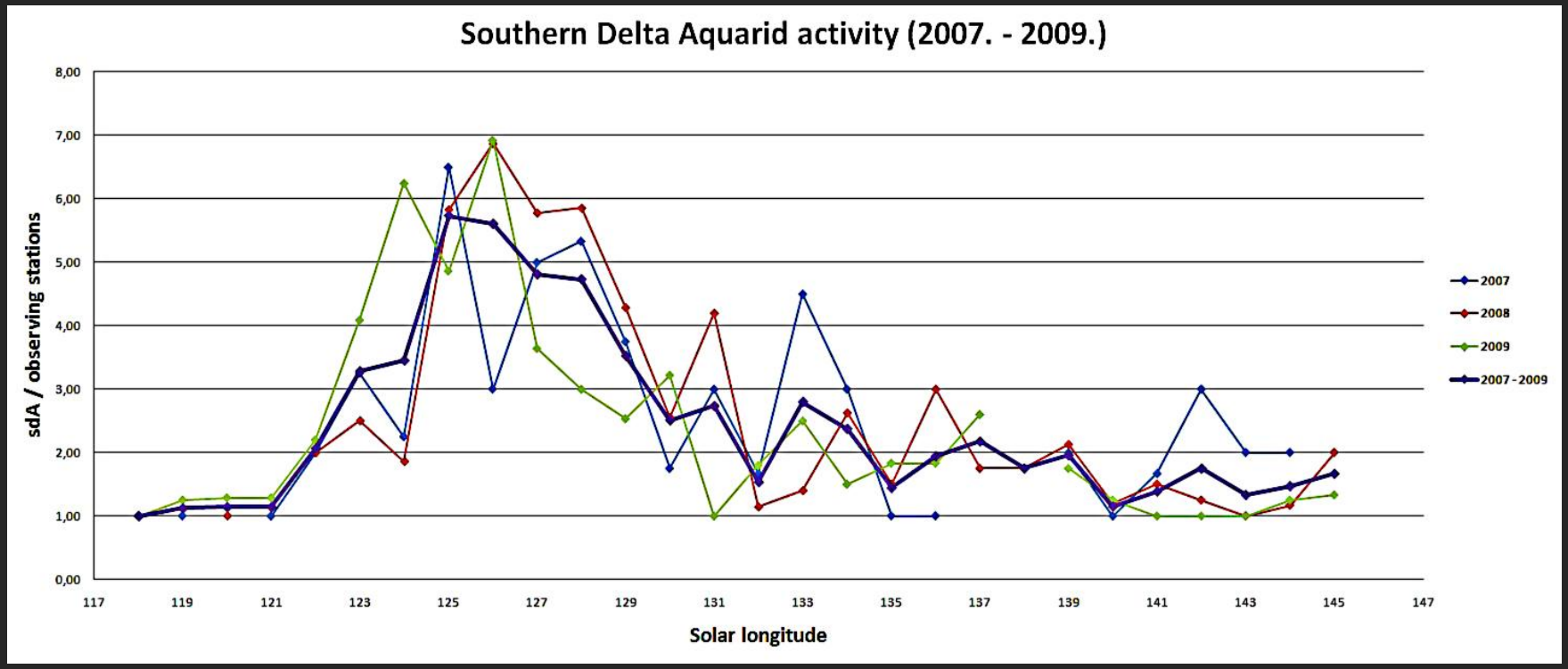
2.2. Radiant map - UFOOrbit



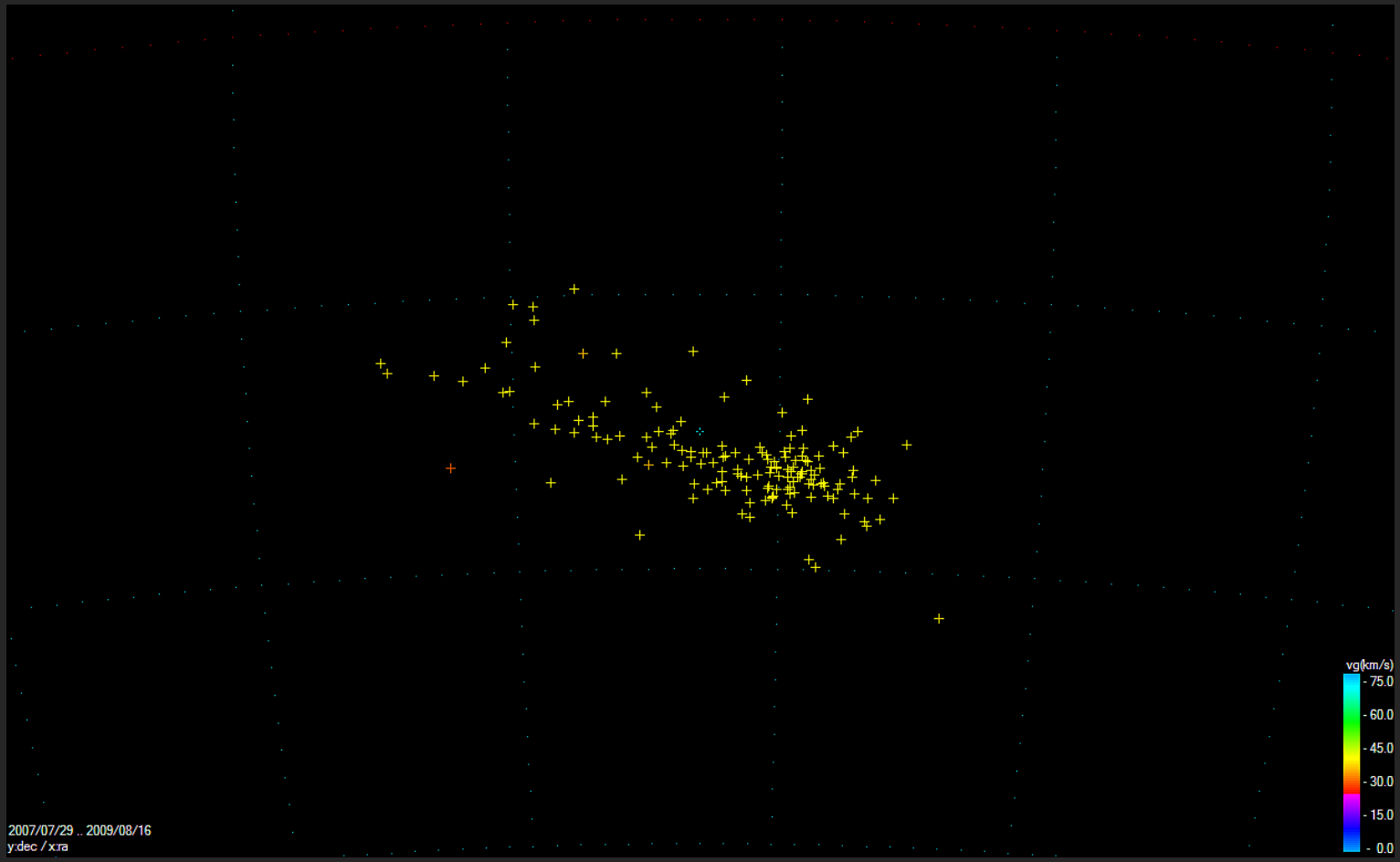
July – August 2007 – 2009 radiant map – Croatian Meteor Network

2.3. Activity of Southern Delta Aquarids

- presented results were obtained with UFOOrbit (SonotaCo Network)
- observations from July 20 to August 18 (λ = 118° - 145°)
- 1189 single station meteors

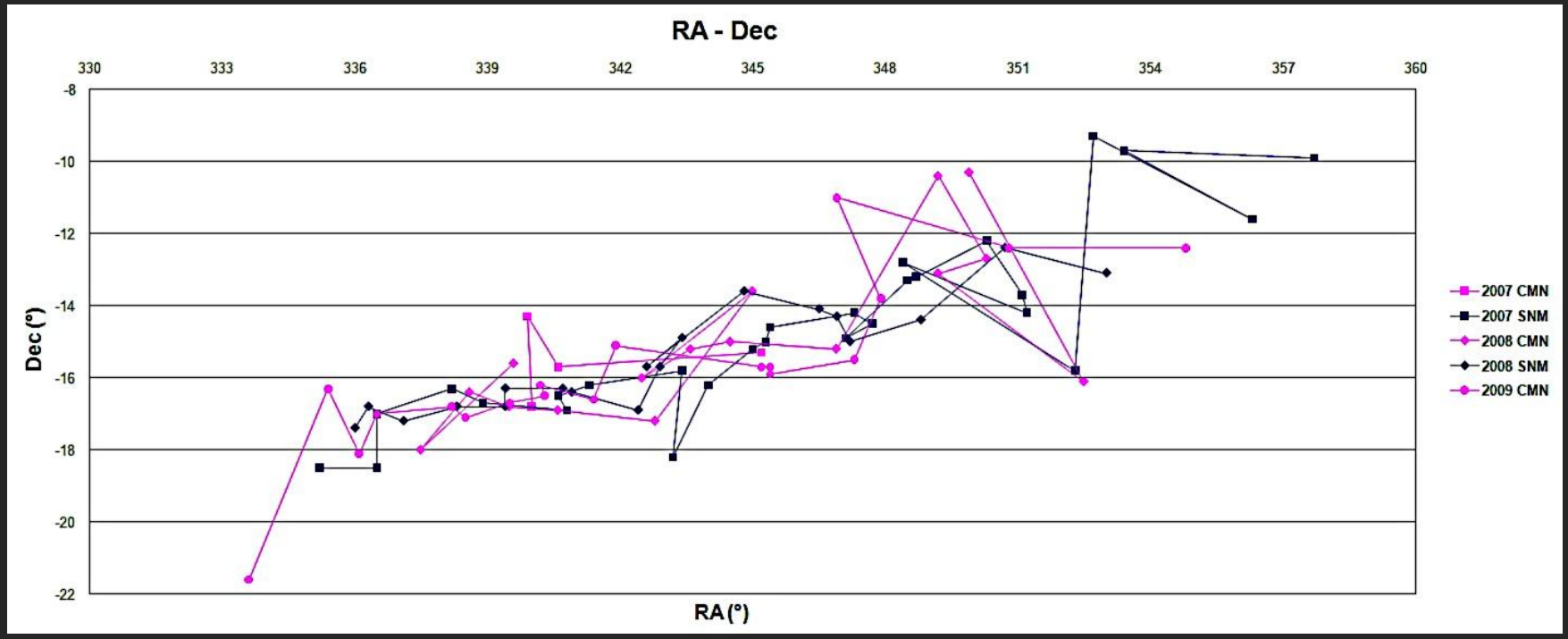


2.4. Radiant drift



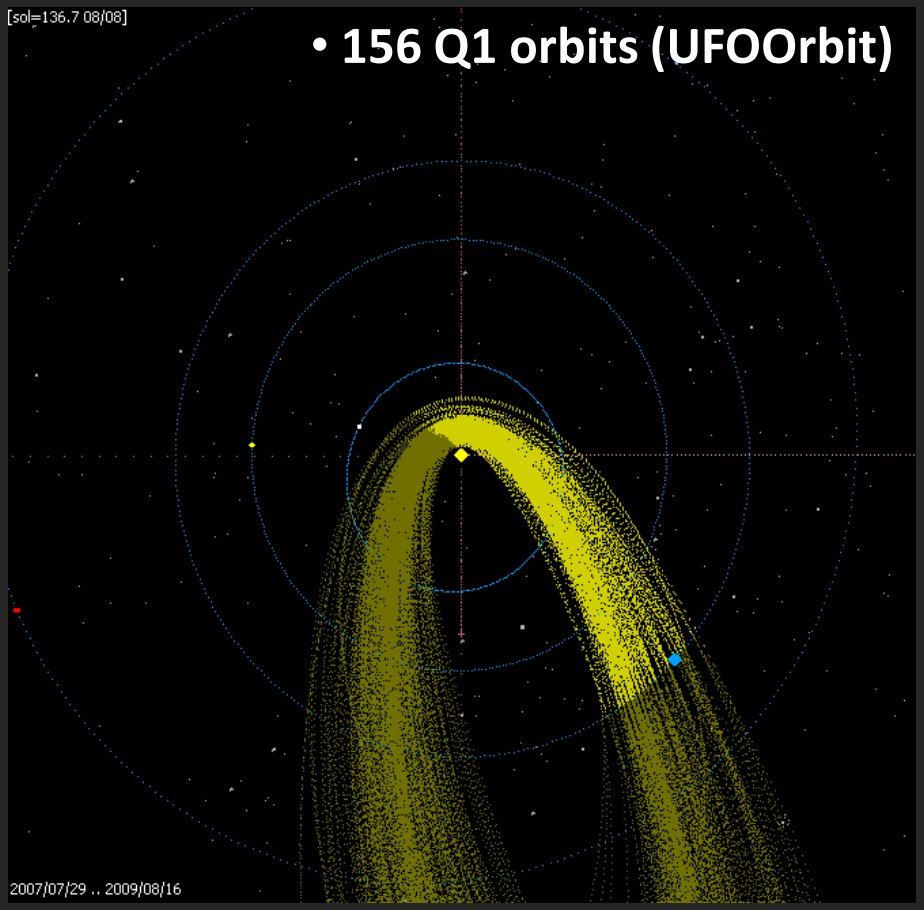
Radiant drift from UFOOrbit: July – August, 2007 - 2009 (504 meteors)

2.4. Radiant drift

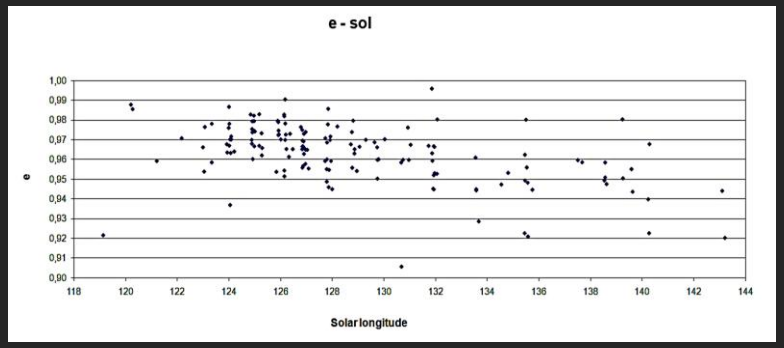


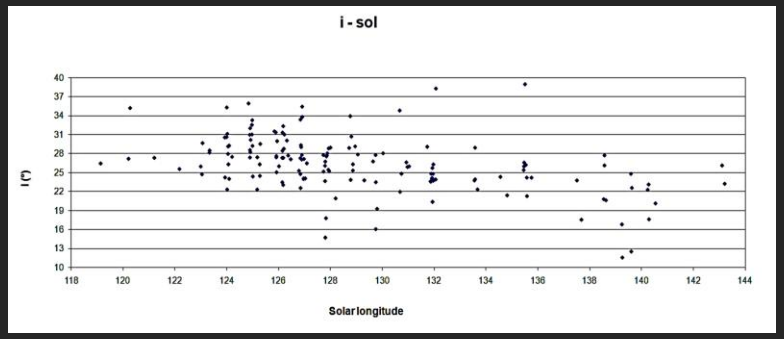
RA – Dec drift → linear regrresion (0.7° per day)

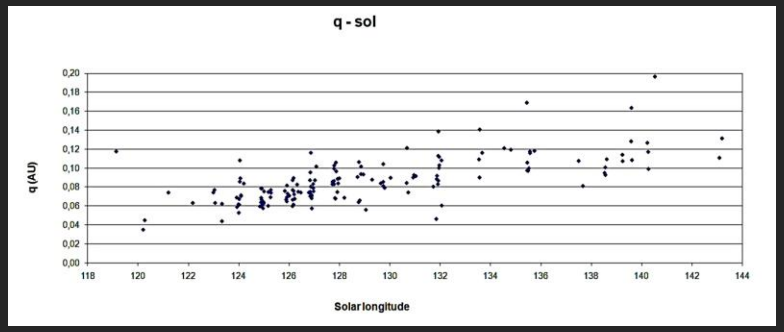
2.5. Orbits

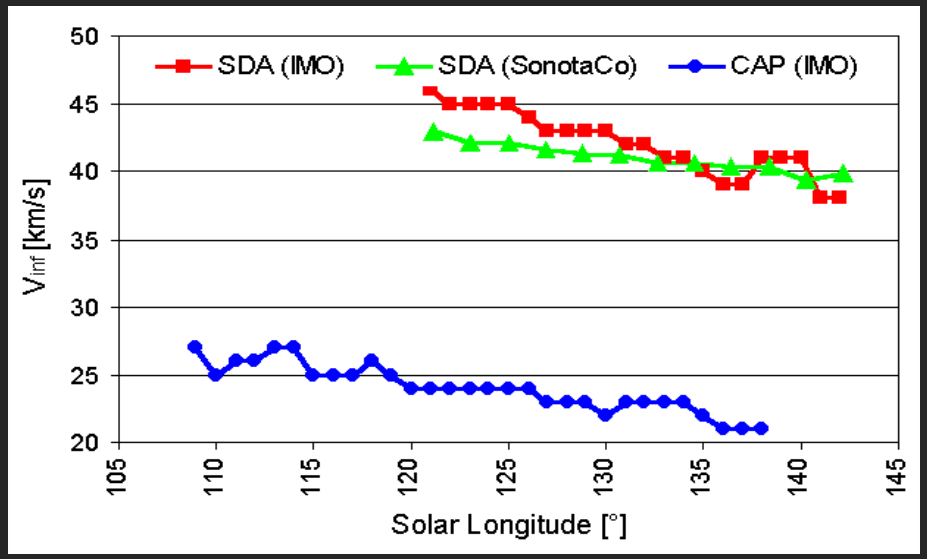


Orbits of sdA with an Earth position



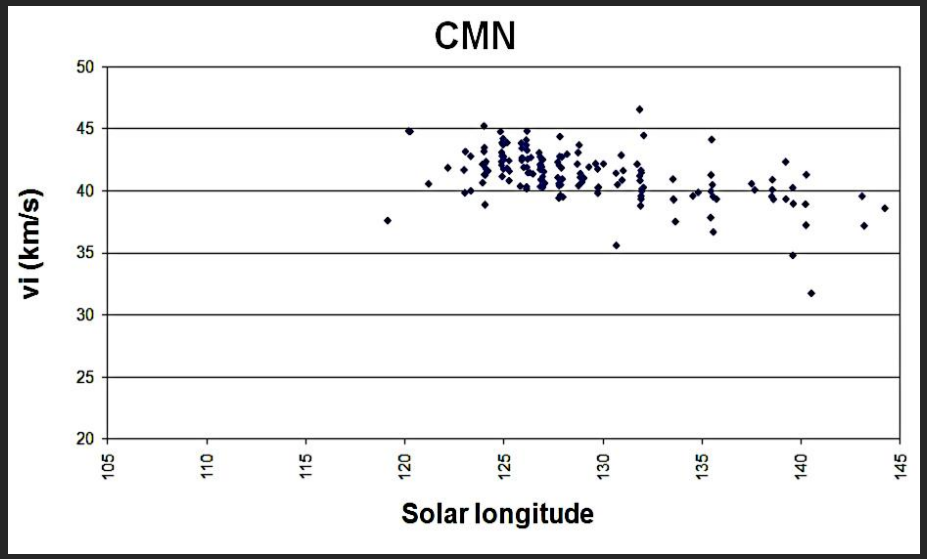




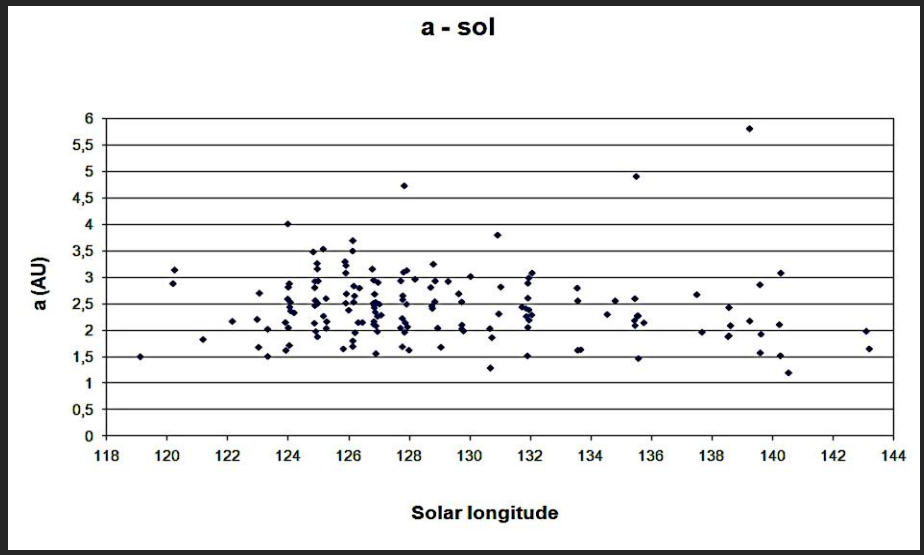


Comparison with SonotaCo and IMO network

Possible explanation?



vi vs. solar longitude



a vs. solar longitude

Thank you for your attention!
Questions?

Created with FOV3D script (ESA)