

The UAE Meteor Monitoring Network



Presented by: Dr. Fatima AlAydaos
Acting Head of space science &
technology section
UAE Space Agency

- Introduction & Tower construction
- Observations & Statistics
- UFO Software programs

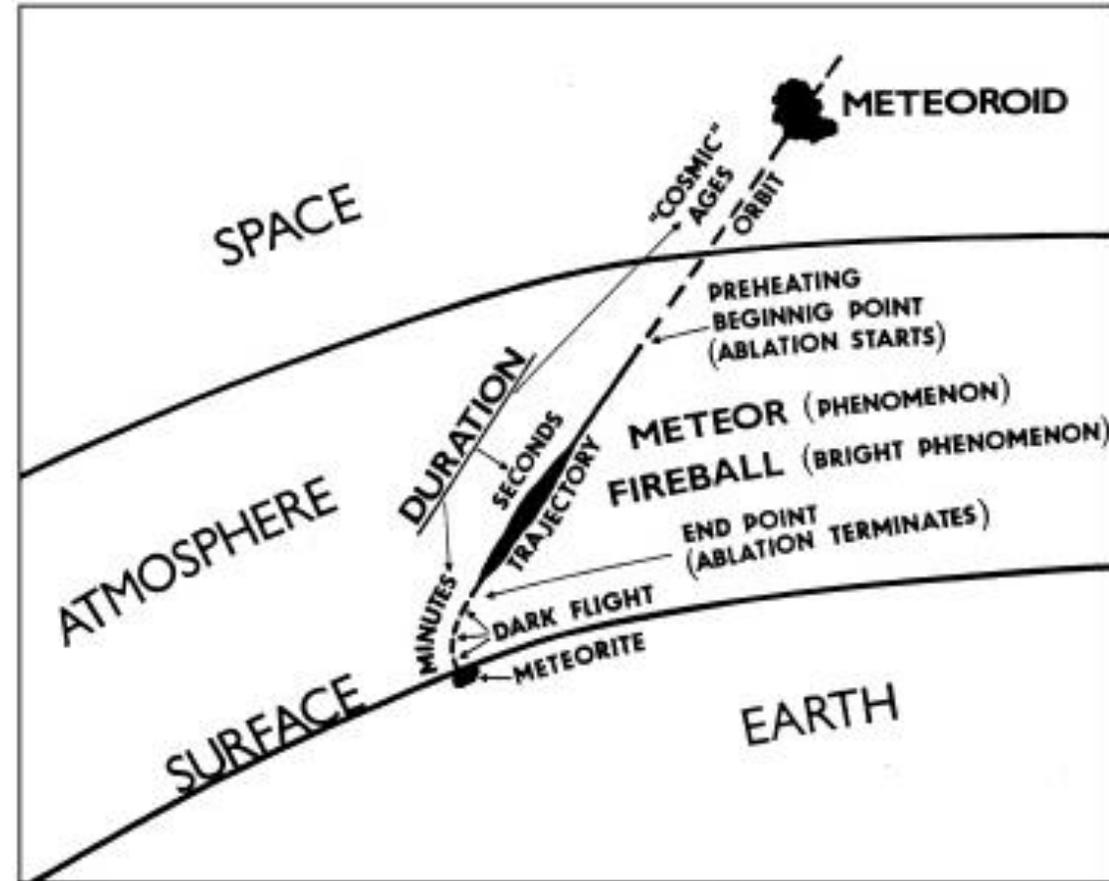


- **Meteoroids** are chunks of rock and ice out in space.
- **Meteors** are the streaks of light that you see as a meteoroid ablates, or burns up, in the Earth's atmosphere –commonly called a ‘shooting star’ or ‘falling star’.
- A **fireball** is a bright meteor, its peak magnitude is brighter than Venus.
- A **super bolide** is a very bright meteor, its peak magnitude is brighter than the full Moon.
- **Meteorites** are what's left of the meteor if it hits the surface



Terminology

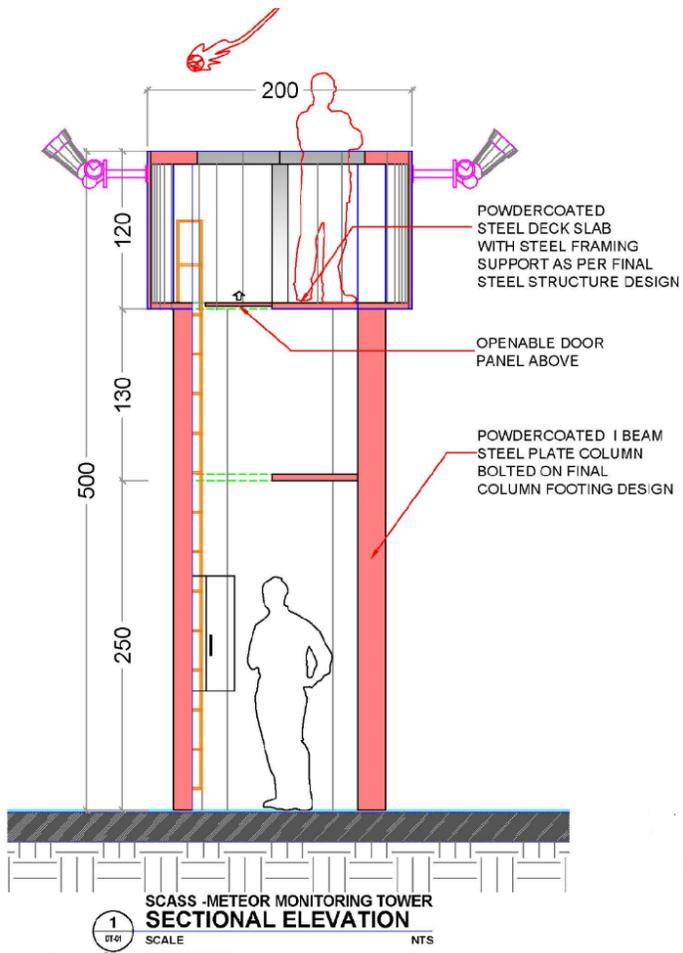
- Meteoroid (outer space)
- Meteor (120 km – 80 km)
- Meteorite (Earth surface)



Tower Construction



Terminology



Lenses

6mm

8mm

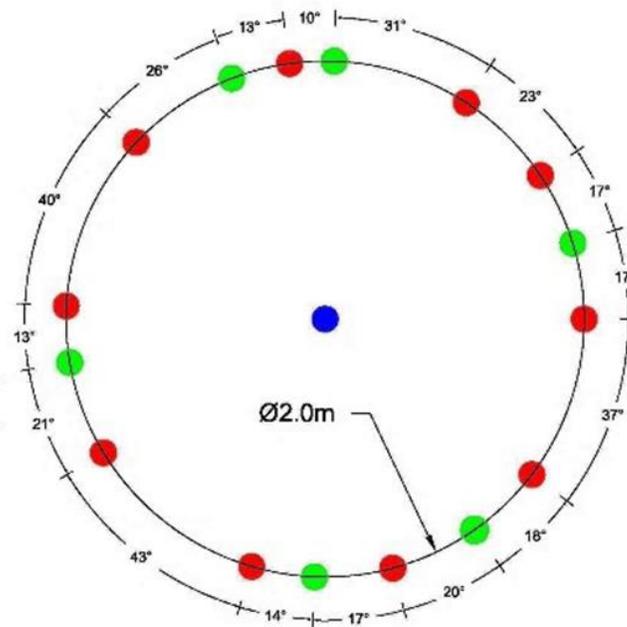
2mm

- Diameter = 200 cm
- Radius = 100 cm
- <--> ● = 62.8 cm
- <--> ● = 104.6 cm

- 1 CCD Camera 2 mm
- 10 CCD Camera 8 mm
- 6 CCD Camera 6 mm

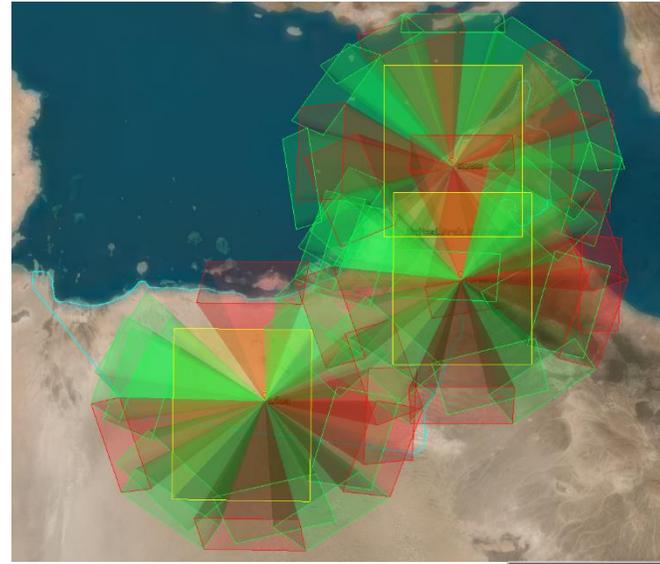
- Elevation Angle = 90°
- Elevation Angle = 23° <--> 40°
- Elevation Angle = 26° <--> 50°

- Sky Coverage = 2397 (°)²
- Sky Coverage = 884 (°)²
- Sky Coverage = 1523 (°)²

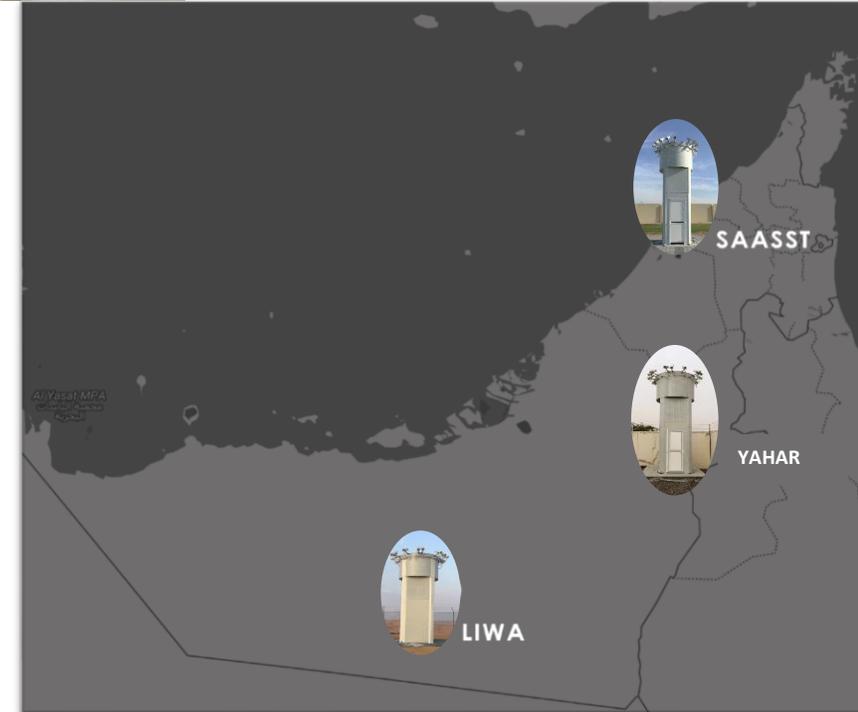


Towers Locations

- Based on STK simulations
- Sharjah tower – Sharjah Academy for Astronomy, Space Sciences and Technology
- Al-Yahar tower in Al Ain – National Center of Meteorology and Seismology (NCMS)
- Liwa tower in Abu Dhabi – National Center of Meteorology and Seismology



وكالة الإمارات للفضاء
UAE SPACE AGENCY



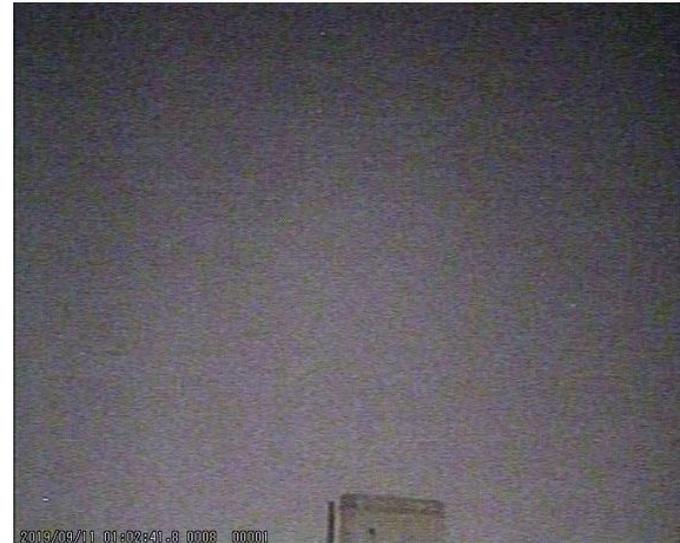
Distance between the towers

- Sharjah – Liwa : 300km
- Sharjah – Alyahar : 116 km
- Alyahar – Liwa : 221km



Observation



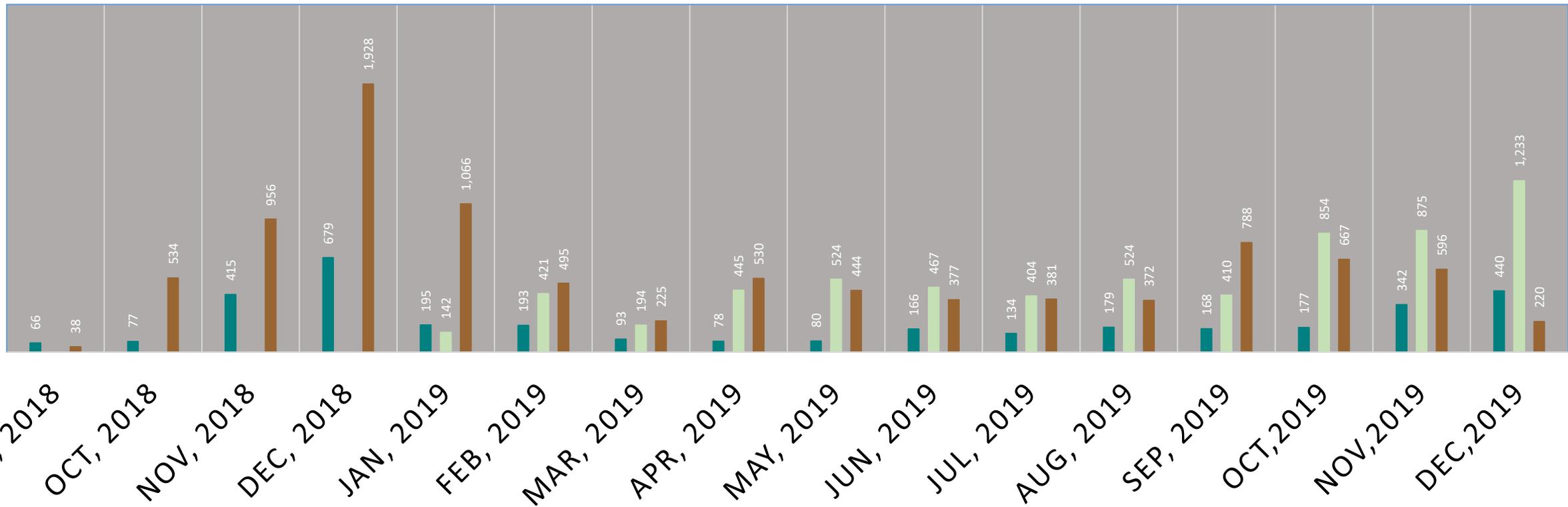


Statistics



NETWORK STATISTICS

■ Sharjah ■ Al-Yahar ■ Liwa

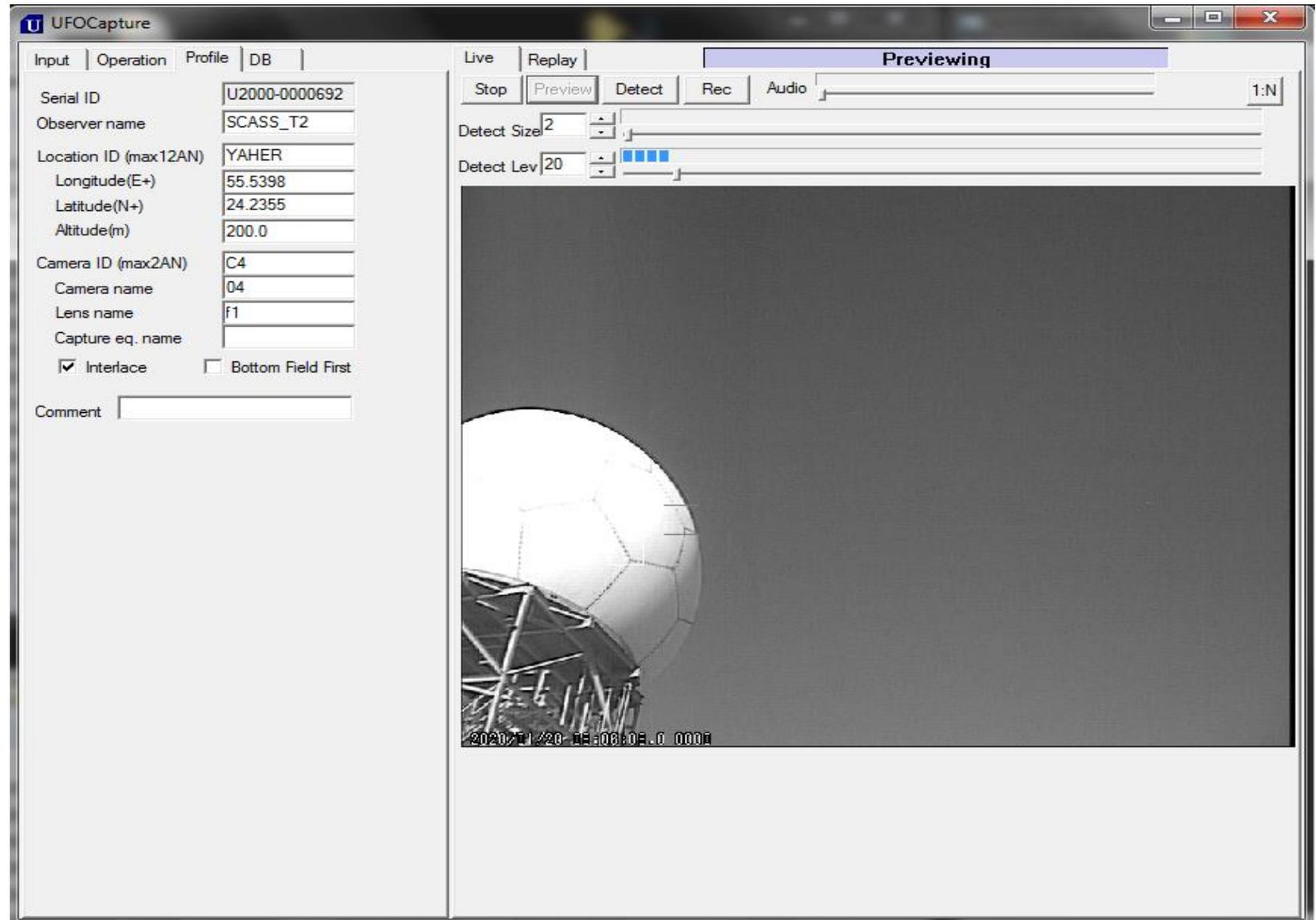


UFO Software programs



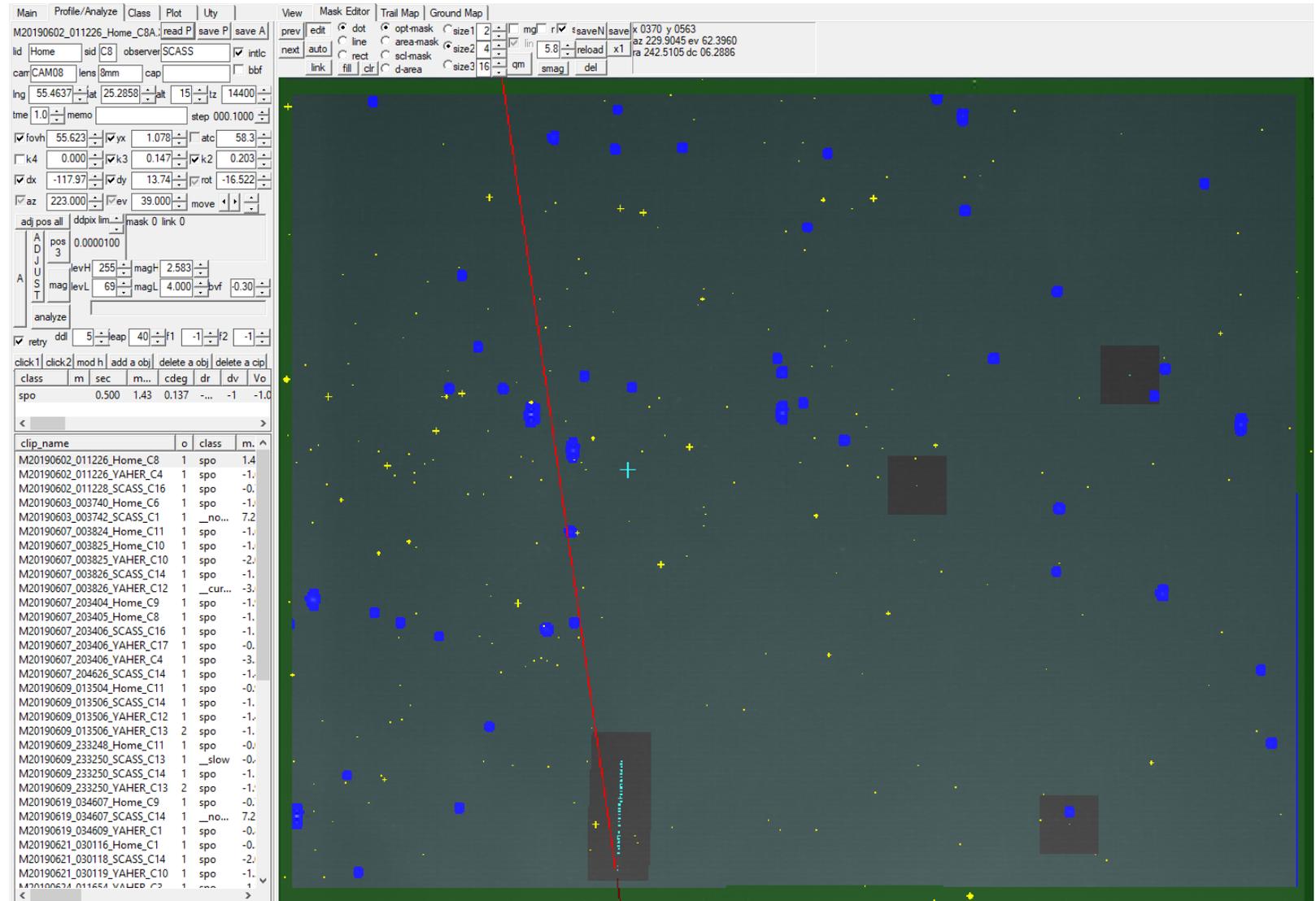
UFO Capture

Used to detect motion in the sky and record meteors.

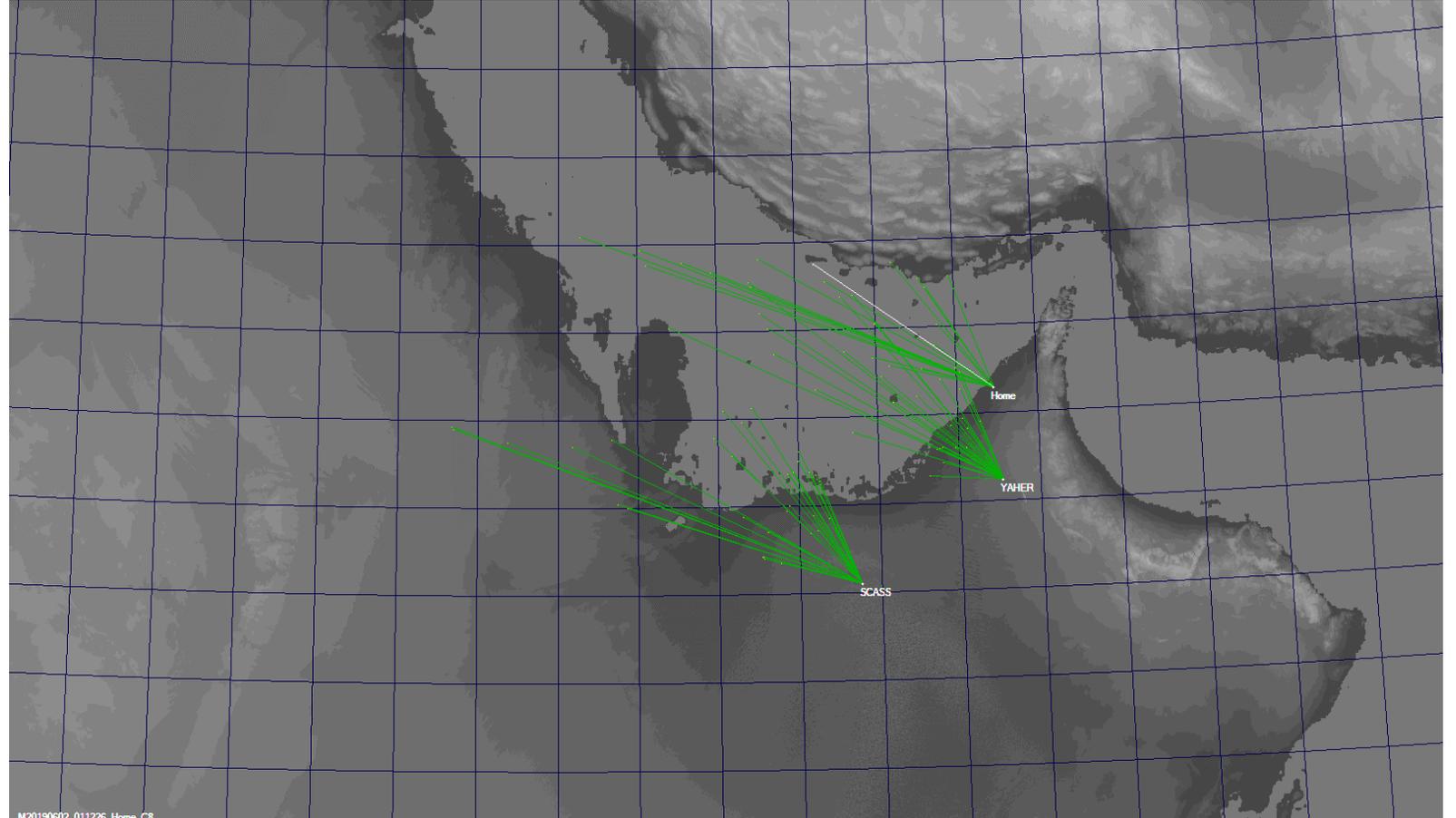


UFO Analyzer

- Analyzes meteor videos by matching the stars appearing in the video (in blue) to the stars provided by the program (in yellow).
- Provides information about meteors such as the magnitude, which shower they belong to, angular velocity, etc.



UFO Analyzer output maps



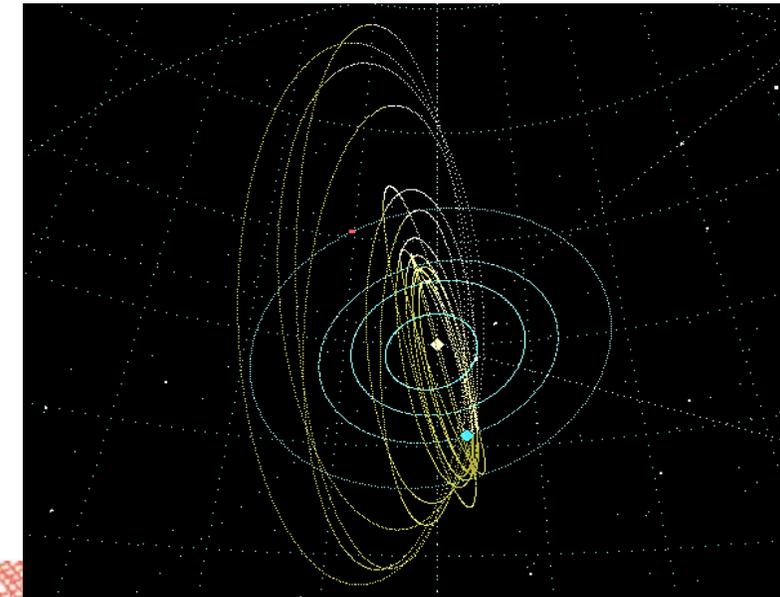
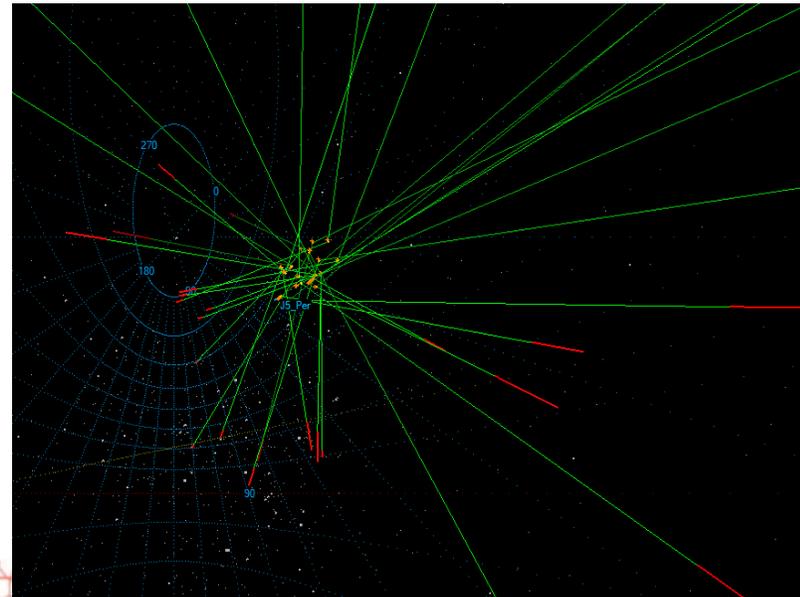
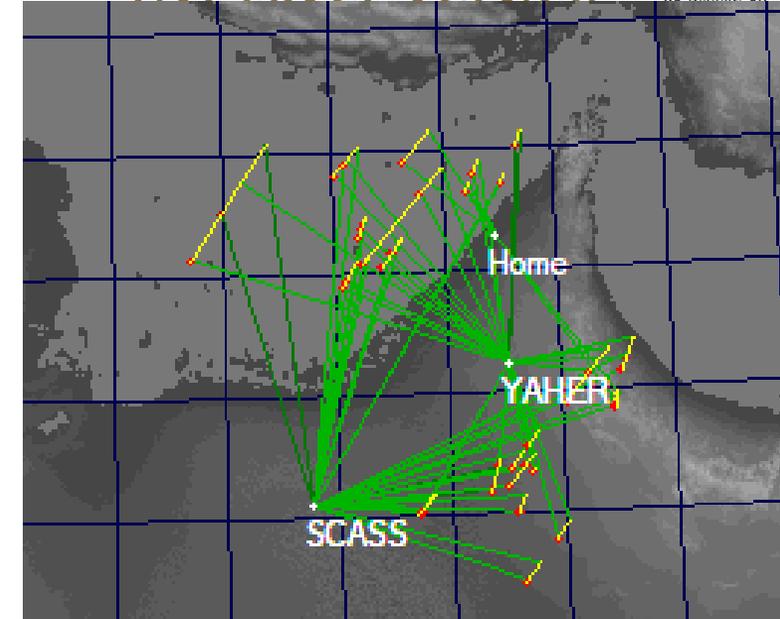
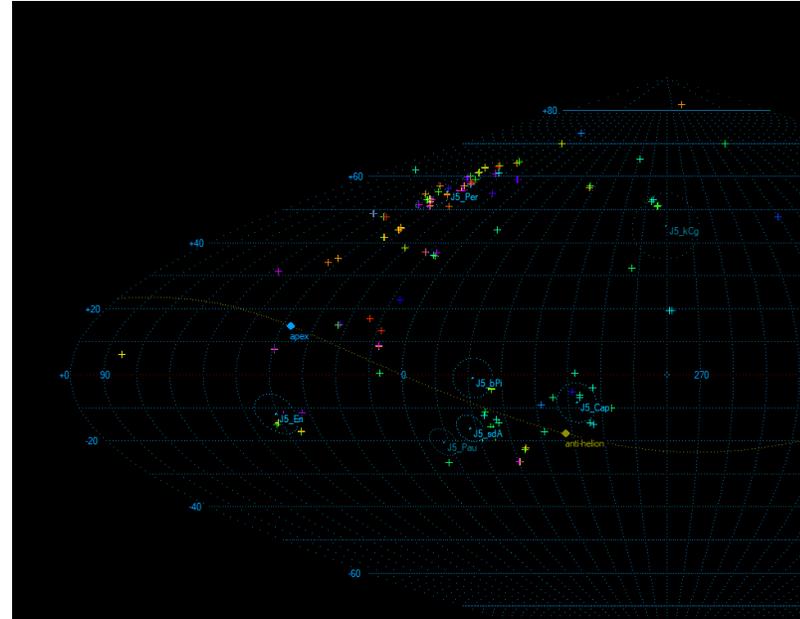
Ground map sheet shows meteor's trail on the ground.





UFO Orbit

- Only works with double detections at least
- Displays radiants of meteors along with their speed.
- Presents meteor trail maps and orbits
- Illustrates the location in the sky of where the meteor has been observed by two towers.



Published Articles

- International Meteor Conference Proceedings
- ROOM the space journal of ASGARDIA

<https://room.eu.com/article/uae-meteor-and-debris-monitoring-network>

- eMeteorNews

<https://www.meteornews.net/2019/09/27/the-uaemmn-a-prominent-meteor-monitoring-system-in-the-gulf-region/>



UAEMMN Team members

- Supervisor: Dr. Ilias Fernini
- Research Assistants
 - Mohamed Talafha
 - Aisha Al-Owais
 - Maryam Essa Sharif
 - Salma Subhi
 - Issam Abu-Jami
 - Masa Alnaser
 - Yousef Al-Hammadi
 - Ridwan Fernini
 - Shahab Mohammad
 - Ahmad Hassan
 - Yahya Al-Nahdi



THANK YOU

UAE SPACE AGENCY

Tel: +971 2 202 2222

Website: www.space.gov.ae

Email: Info@space.gov.ae

Email: F.alaydaros@space.gov.ae

