First Year Results from the CAMS System Cameras for Allsky Meteor Surveillance

Peter Jenniskens, SETI Institute Dave Holman Pete Gural

Funding Agency

NASA

Prime Contract



DVR Development



Software Development





Dr. Peter Jenniskens Principle Investigator SETI Institute



Pete Gural Meteor analysis software



← Dave Holman Bob Haberman CAMS data reduction and analysis





The People Involved in CAMS

Bryant Grigsby Support astronomer Lick Observatory



Jim Albers Station Sunnyvale



Kathryn Steakley Anthony Berdeu Summer interns SETI Institute NASA ARC



Rick Morales Director Fremont Peak Observatory Association

http://cams.seti.org

CAMS Goal: Scale up the number of of meteoroid orbits using multi-station video observations

Success! Over 47,000 orbits in the 1st year of operation

e.g. Data from the 1st week of December



IAU database in 2003

CAMS + SonotaCo databases

Ongoing Collection of Meteor Databases

EO Video: IMO Video Meteor Network

- Led by Sirko Molau, Worldwide but mostly EU
- MetRec software http://www.imonet.org/
- Over 1,000,000 single-station observations
- Meteor showers inferred from statistical analysis

EO Video: CMN Network

- Led by Damir Segon, Croatia
- MeteorScan/UFO software
- 1211 multi-station orbits 2007
- http://hmm.homeip.net/home/hmm/downloads /downloads.html







Bistatic Radar: CMOR

- Univ of Western Ontario, Canada
- Led by Dr. Peter Brown
- Millions of orbits
- Less precise than video
- Sees mostly 23-45 km/s

EO Video: SonotaCo Network

SonotaCo

- Led by Touru Kanamori, Japan
- UFO software http://sonotaco.jp/doc/SNM/
- 114,000 multi-station orbits
- Published database 2007-2011

CAMS: Scaling up Multi-Station Video → Automation







BCSI DVF







Quality Control → Interactive Coincidence Analysis



One year: 47,000 orbits (November 2010 shown)



Following Charts Yellow/Blue Indicates Established Shower at Beijing/IAU this Year

March



Late April



Early May



Late June



Late July

Combined CAMS and SonotaCo



August



Early September



Early October

Combined CAMS and SonotaCo



Late October



Early November



Early December



Late December



Early January



Mid January



Early February (New Shower)



CAMS Successes

47,000 Precisely estimated meteor orbits in just one year

Established 31 showers in the IAU database, total now 95

Automated capture, compression, detection, calibration

Multi-parameter fit algorithm for trajectory estimation

HIL for coincidence

Extending capabilities for individuals to build a network

Single, Dual and Quad camera options

Establish your own CAMS survey area:

http://cams.seti.org





Statistics Latitude Longitude



